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AN ARSENICAL WITH A BRILLIANT RECORD OF EFFECTIVENESS AND SAFETY

MAPHARSEN

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TREATMENT OF STAPHYLOCOCCIC, PNEUMOCOCCIC, GONOCOCCIC AND OTHER INFECTIONS

WITH PENICILLIN

CARL G. HARFORD, M.D.
SAMUEL P. MARTIN, M.D.
PAUL O. HAGEMAN, M.D.
AND
W. BARRY WOOD JR., M.D.
ST. LOUIS

In June 1942 the Committee on Chemotherapeutic and Other Agents of the National Research Council was requested to organize a cooperative clinical study to evaluate the effectiveness of penicillin in the treatment of bacterial infections. A relatively large group of clinics was asked to participate in the investigation in order that adequate data might be accumulated as rapidly as possible. The preliminary results of the cooperative undertaking have been summarized in a recent publication.[1] The present report deals with a more detailed account of the use of penicillin [2] in the treatment of 103 patients in this clinic. Our experience with penicillin in the treatment of syphilis will be published elsewhere.

METHODS

Selection of Patients.—In this study preference was given to patients with fulminating bacterial infections, particularly those known to be unresponsive to sulfonamide chemotherapy. Less severe infections were treated in a small group of patients known to be hypersensitive to sulfonamides. Thirteen patients with gonorrhea were treated with penicillin after repeated courses of sulfonamide therapy had failed to influence the infection. In general, patients were not accepted for penicillin therapy until the bacterial origin of the infection had been established by culture. In a few cases treatment was begun before the results of cultures were known, but in each instance there was adequate clinical evidence of a specific bacterial infection.

Administration of Penicillin.—The sodium salt of penicillin (usually containing 300 units or more per milligram) was dissolved in isotonic solution of sodium chloride in concentrations of 5,000 to 20,000 units per cubic centimeter. Only the amount of penicillin needed for twenty-four hours of treatment was put into solution at one time. All penicillin solutions were kept in the refrigerator between injections. Systemic treatment was accomplished by either intravenous or intramuscular injections. In many instances it was found convenient to inject the penicillin into the rubber tubing of a continuous intravenous drip. The dosage employed varied from 5,000 to 40,000 [3] units every one, two or four hours, depending on the circumstances. The total number of units of penicillin administered in each case depended on the severity of the infection and the relative susceptibility of the causative bacterium to the drug. Treatment was continued over longer periods when clinical response was slow or recurrence seemed likely.

All accessible infected foci were treated by local injections of penicillin. In such cases systemic therapy was given at the same time. Infected wounds were treated by gauze packs saturated in penicillin solution containing 1,000 units per cubic centimeter. Freshly saturated packs were applied at least once a day. Intrapleural injections of 5,000 to 20,000 units every twenty-four hours were used in the treatment of infections within the pleural space. The usual initial intrathecal dose employed in the treatment of meningitis was 20,000 units in 2 cc. of isotonic solution of sodium chloride. Further intrathecal injections were given each day in decreasing amounts and were continued until all signs of meningitis had subsided.

Other Chemotherapy.—It will be noted in the tables and charts that sulfonamide therapy preceded or followed treatment with penicillin in a number of instances. In some cases the infection had progressed in spite of intensive sulfonamide therapy; in others, sulfonamide drugs had been administered before admittance to the hospital. During the early months of the study, when the supply of penicillin was limited, sulfonamides were given in a few cases after recovery to prevent recurrence of infection. In no instance were sulfonamide drugs and penicillin given at the same time.

Clinical Observations.—All patients treated were admitted either to the Barnes Hospital or to closely affiliated hospitals.[4] Daily visits were made to each patient during the active phase of the illness and complete records were kept in every case. Patients with gonorrhea were retained in the hospital for thirty days after the completion of therapy in order to avoid the possibility of confusing reinfection with relapse. All patients thus far treated have been included in this report. All fatal cases in which autopsies were per-

From the Department of Internal Medicine, Washington University School of Medicine, the Oscar Johnson Institute for Medical Research, and Barnes Hospital, St. Louis.

1. Keefer, C. S.; Blake, F. G.; Marshall, E. K., Jr.; Lockwood, J. S., and Wood, W. Barry, Jr.: Penicillin in the Treatment of Infections: Statement by the Committee on Chemotherapeutic and Other Agents, Division of Medical Sciences, National Research Council, J. A. M. A. **122**: 1217-1224 (Aug. 28) 1943.

2. The penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for clinical investigations recommended by the Committee on Chemotherapeutic and Other Agents of the National Research Council.

3. Proportionately smaller doses were employed in the treatment of infants and small children.

4. St. Louis City Hospital, City Isolation Hospital, St. Louis Children's Hospital and the Jewish Hospital of St. Louis.

formed were studied by Dr. Robert A. Moore of the Department of Pathology and will be reported in a separate publication.

RESULTS

Staphylococcic Infections.—The results of penicillin therapy in the treatment of staphylococcic infections are shown in table 1. There were 16 patients with bacteremia; of these all had metastatic pneumonia and 3 were suffering from bacterial endocarditis. In this entire group of patients only 2 died: 1 with bacterial endocarditis and the other with furunculosis of the face, metastatic pneumonia, cavernous sinus thrombosis and acute pericarditis (cases 13 and 14). In addition there were 4 instances in which cultures of the blood failed to reveal staphylococci but in which clinical evidence left no doubt that bacteremia had previously existed (cases 17, 18, 19 and 20). In the latter group there was but one death. Five patients with acute localized infection without bacteremia (cases 21, 22, 23, 24 and 25) were treated with penicillin, and 1 died. There were 6 patients with acute osteomyelitis, 3 of whom had a complicating bacteremia (cases 10, 18 and 19). Surgical operation was carried out in only 3 of these cases. All of the patients were obviously benefited by penicillin therapy, none of them having sustained a recurrence of the infection several months after treatment.

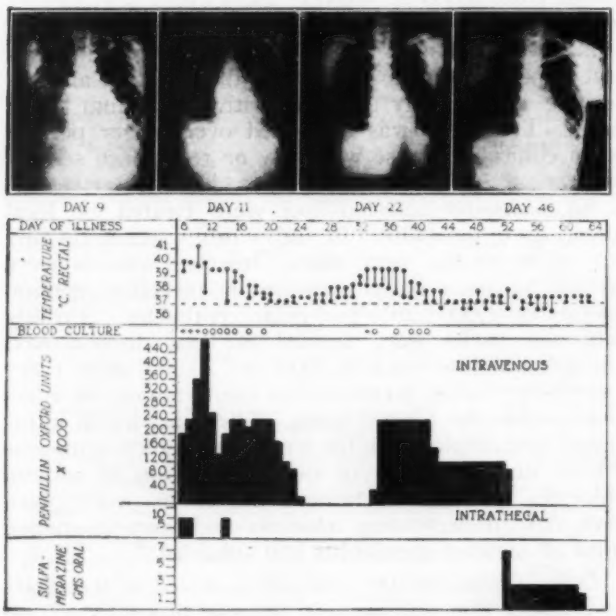

Fig. 1.—Staphylococcic infection, with pulmonary infiltration.

The therapeutic response in chronic osteomyelitis was less encouraging. Four of 7 patients treated were improved, 2 received at least temporary benefit and 1 patient has gone for more than twelve months without drainage from the original sinus.

The following case reports illustrate the effectiveness of penicillin in the treatment of severe staphylococcic infections:

Case 1.—*History.*—B. B., a white woman aged 26, "picked a pimple" on her left cheek eight days before entering the hospital. On the following day she had a chill, and the inflammatory process spread over the entire left side of her face. She was treated with cold moist applications to the face and two tablets of a sulfonamide drug every three hours. In spite of this therapy the local lesion continued to spread and chills continued. On the seventh day of the illness the patient developed a stiff neck. When first seen in the hospital, on the eighth day, she was comatose, dyspneic, cyanotic and obviously dehydrated. There were an extensive carbuncle of the face with numerous points of drainage, swelling of the eyelids and severe chemosis. Eyegrounds and external ocular movements were normal, but there was definite trismus. Numerous crepitant and sonorous rales were heard at the base of both lungs. Pleural friction rubs were heard bilaterally, and an x-ray plate of the chest showed many patches of consolidation throughout both pulmonary fields. The liver and spleen were both palpable. There was pronounced stiffness of the neck. The spinal fluid contained 80 cells per cubic millimeter, 40 per cent of which were polymorphonuclear leukocytes. The fluid was sterile. Blood culture revealed 70 colonies of hemolytic Staphylococcus aureus per cubic centimeter of blood, and the same organism was isolated from the conjunctiva. There was a leukocytosis of 18,000 and an anemia of 3.88 million red blood cells with 11 Gm. of hemoglobin.

Penicillin was administered as shown in figure 1, and gradual improvement took place. The local lesion subsided; the fever fell by lysis, and the pulmonary infiltration decreased. Cerebrospinal fluid on the fourteenth day of the disease contained 12 cells per cubic millimeter. On the twelfth day of illness a pleural effusion was demonstrated in the right chest. The fluid recovered on thoracentesis was sterile and contained 9,300 cells, 69 per cent of which were polymorphonuclear leukocytes. Penicillin therapy was discontinued on the twenty-fourth day of illness, and nine days later a relapse had occurred, as evidenced by high fever, bacteremia and a pleural effusion in the left chest. Further penicillin treatment [5] resulted in the patient's prompt recovery.

Summary.—A 26 year old woman with staphylococcic bacteremia, extensive metastatic pulmonary lesions and an aseptic meningitis, all resulting from a widespread carbuncle of the face, responded satisfactorily to penicillin therapy. Nine days after the treatment was discontinued the patient suffered a relapse with bacteremia, but recovered completely after a second course of penicillin.

Case 2.—*History.*—F. A., a white man aged 54, was apparently well until four days before being admitted to the hospital, at which time he noticed tenderness, redness and swelling of the nose. On the day before entry he began to have chills and fever, and on the following day he complained of severe chest pains exaggerated by respiration. When first seen at the hospital, the whole right side of his face was swollen, as shown in the photograph in figure 2. There was some swelling on the left side of the face also. Although he was given 3.5 Gm. of sulfamerazine shortly after his admission to the hospital, this form of therapy was soon discontinued and on the second hospital day penicillin treatment was started. During the first twelve hours in the hospital his condition rapidly became worse. The percussion note was found to be impaired over both lung bases, where there were heard widespread crepitant and sonorous rales and bronchial breath sounds. Friction rubs were also heard over both lung bases. A roentgenogram of the chest showed patchy consolidation throughout the right lung and in the left lower lung field. Blood cultures showed hemolytic Staphylococcus aureus, and the white blood cell count was 17,800. Therapy with penicillin resulted in the patient's steady clinical improvement, the fever subsiding by lysis. On the seventh day of the disease three points of drainage made their appearance on the nose. The material which drained from these areas contained hemolytic Staphylococcus aureus. On the twelfth day of illness the penicillin was given intramuscularly instead of intravenously because of thrombosis at the site of a continuous intravenous injection. On the seventeenth day the signs of a pleural effusion were noted, and 485 cc. of serosanguineous fluid containing hemolytic Staphylococcus aureus was removed by thoracentesis. The penicillin was instilled into the pleural cavity at the time of the thoracentesis, and additional intrapleural injections of penicillin were given on the twentieth and twenty-fifth days. Recovery,

5. On the thirteenth day of illness at the time when the left pleural effusion was demonstrated, 10,000 units of penicillin (not shown in figure 1) were instilled into the pleural cavity.

TABLE 1.—*Staphylococcic Infections*

Case No.	Age	Sex	Diagnosis	Blood Culture	Duration of Disease, Days	Penicillin Treatment: Total Dosage, Units × 1,000,000	Penicillin Treatment: Days of Therapy	Body, Wt., Kg.	Penicillin Treatment: Routes of Administration *	Other Specific Treatment	Results †	Comment
1	26	♀	Carbuncle of face; metastatic pneumonia; empyema	+	8	5.74	35	38	IV, IT, IP	Sulfonamide (B and A)‡	R	Fulminant infection, comatose on entry
2	50	♂	Furuncle of nose; metastatic pneumonia; empyema	+	4	3.35	20	66	IV, IM, IP	Sulfadiazine (B)	R	Rapid recovery
3	17	♂	Cellulitis of arm and chest; metastatic pneumonia	+	7	4.12	27	46	IV, IM, IP	Sulfadiazine (B)	R	Fulminant and massive infection
4	4	♂	Questionable osteomyelitis of femur; metastatic pneumonia	+	5	0.58	11	17	IV, IM	Sulfapyridine (B)	R	No x-ray evidence of osteomyelitis; organisms recovered from the bone
5	11 wk.	♂	Furuncle; metastatic pneumonia	+	9	0.09	7	32	IV, IM, IP	Sulfadiazine (B)	R	
6	3 wk.	♂	Cellulitis of neck; metastatic pneumonia	+	8	0.187	20	31	IV, IP, local	Sulfapyrazine (B)	R	Colonies on blood pour plate too numerous to count
7	8	♂	Bacteremia; metastatic pneumonia	+	4	0.88	12	34	IV, IT	Sulfapyrazine (B); sulfadiazine (A)	R	No primary focus found
8	2	♀	Abscess of ankle; pericarditis	+	8	0.78	11	11	IV, IM, IPericard	.....	R	Organism recovered from pericardial cavity
9	17	♂	Osteomyelitis of maxilla; meningitis	+	30	1.716	11	42	IV, IT, INasal	Sulfamerazine (B); incision of maxilla and orbit	R	Meningitis developed while patient was receiving sulfamerazine
10	13	♂	Osteomyelitis of ilium	+	6	1.336	11	42	IV, IM	Sulfamerazine (A)	R	140 organisms per cc. blood; comatose on entry
11	58	♂	Carbuncle of lower lip; metastatic pneumonia; pleural effusion	+	6	1.01	12	98	IV, IP	Sulfonamide (B)	R	
12	21	♀	Carbuncle of face; pterygoid thrombosis; meningitis; metastatic pneumonia	+	13	3.60	22	50	IV, IM, IT	Sulfonamide (B)	R	Meningitis sterile
13	16	♂	Furuncle of face; metastatic pneumonia; cavernous sinus thrombosis; pericarditis	+	9	0.86	1½	..	IV, IT	Sulfadiazine (B)	D	Treatment late in disease
14	33	♀	Bacterial endocarditis	+	9	0.27	6	60	IV	.....	D	Death from rupture of abscess of brain
15	31	♀	Bacterial endocarditis	+	56	4.86	13	..	IV, IM	Sulfonamide (B)	R (4 mos.)	Multiple pulmonary infarcts; systolic murmur in tricuspid area
16	16	♀	Bacterial endocarditis	+	8	3.157	25	53	IV, IM	Sulfadiazine (B)	R (2 mos.)	
17	16	♀	Umbilical cord infection; furuncle of neck; metastatic pulmonary lesions; empyema	0	6	0.560	7	3.2	IM, IP	Sulfadiazine (B)	R	Empyema drained by catheter without rib section
18	7	♀	Osteomyelitis of tibia	0§	6	4.525	29	20	IV, IM, locally	Sulfonamide (B)	I	X-ray evidence of osteomyelitis during convalescence
19	11	♀	Osteomyelitis of fibula	0§	7	1.776	11	30	IV, IM, locally	Sulfonamide (B)	I	
20¶	32	♀	Ulcerative colitis; multiple abscesses	0	480	0.840	6	55	IV	Sulfamerazine (B); colostomy	D	Hemorrhage from colon caused death; no staphylococcic lesions at autopsy
21	14	♀	Maxillary sinusitis; orbital cellulitis; cavernous sinus thrombosis	0	20	1.38	10	58	IV, IM, locally	Sulfonamide (B); incision of orbit	R	
22	54	♀	Carbuncle of lip; thrombosis of angular vein	0	14	1.07	11	50	IM	Sulfadiazine (B)	R	Dramatic improvement
23	45	♀	Abscess of nasal septum; cellulitis of face	0	6	1.57	10	90	IV, IM	Incision of abscess	R	
24	20	♀	Acute tracheobronchitis; pregnancy	0	7	0.86	6	..	IM	Sulfadiazine (B)	R	
25	36	♂	Mediastinitis; perforation of esophagus; empyema	0	13	1.029	8	49	IV, IP, locally	Drainage of mediastinum and chest	D	No systemic administration for last four days, shortage of drug
26	15	♂	Brain abscess	0	120	0.025	1	..	Locally	Sulfonamides	R	Single local application at operation with sulfonamides systemically
27	33	♂	Hidradenitis suppurativa	0	58	1.40	14	..	IM	Sulfonamides (B); incision of abscess	R	
28	8	♂	Bronchiectasis with bilateral empyema	0	40	2.285	26	24	IM, IV	Bilateral thoracotomy	I	Prolonged course
29	33	♂	Osteomyelitis of frontal bone	0	7	1.435	12	91	IV, IM	Radical frontal	I	Treated; recurred in 60 days; treated again with penicillin and operation
30	37	♂	Osteomyelitis of thoracic vertebra and fibula; psoas abscess	0	7 yrs.	2.303	14	70	IV, IM, locally	Incision of abscess; sulfamerazine (A)	U I	
31	12	♂	Osteomyelitis of femur, tibia, mandible and ulna	0	2 yrs.	2.100	24	24	IM, IV	Sulfonamide and drainage (B)	U I	Required penicillin and removal of head of femur 60 days later
32	19	♂	Osteomyelitis of humerus	0	150	0.370	6	67	.....	.....	I	No drainage in 1 year
33	49	♂	Osteomyelitis of cervical vertebra; paraplegia	0	6 yrs.	3.290	24	..	IV, IM	Laminectomy	U I	Treated with and without operation
34	54	♂	Osteomyelitis of frontal bone and maxilla	0	70	4.20	34	70	IV, IM, locally	Sulfamerazine (B); sequestrectomy	I	Penicillin used at operation
35	63	♀	Osteomyelitis of orbital wall	0	180	1.170	12	..	IM, locally	Sequestrectomy	R	Penicillin as adjunct to surgery
36	17	♂	Osteomyelitis of femur; tuberculosis of hip	0	240	0.540	11	49	IV	Sulfamerazine (B)	U I	Whole lesion may be tuberculous

* Routes of administration of penicillin: IV = intravenously; IM = intramuscularly; IT = intrathecally; IC = into cisterna magna; IP = into pleural cavity; IPericard = into pericardial cavity; locally = applied to wound; INasal = into maxillary sinus.

† R = recovered; D = died; I = improved; U I = unimproved.

‡ (B) = before penicillin treatment; (A) = after penicillin treatment.

§ Blood cultures positive in another hospital but negative on admission.

¶ Previously reported: Wood, W. B., Jr., and Moore, R. A.: J. Missouri M. A. **40**: 353, 1943.

Note: Legends described in footnotes *, ‡ and † also apply to tables 2, 3 and 4.

following the first thoracentesis, was uneventful, and an x-ray film of the chest taken at the time of discharge showed only pleural thickening and adhesions.

Summary.—A man aged 54 with staphylococcic furunculosis of the nose and cellulitis of the face was treated with penicillin after bacteremia, metastatic pneumonia and bilateral pleurisy

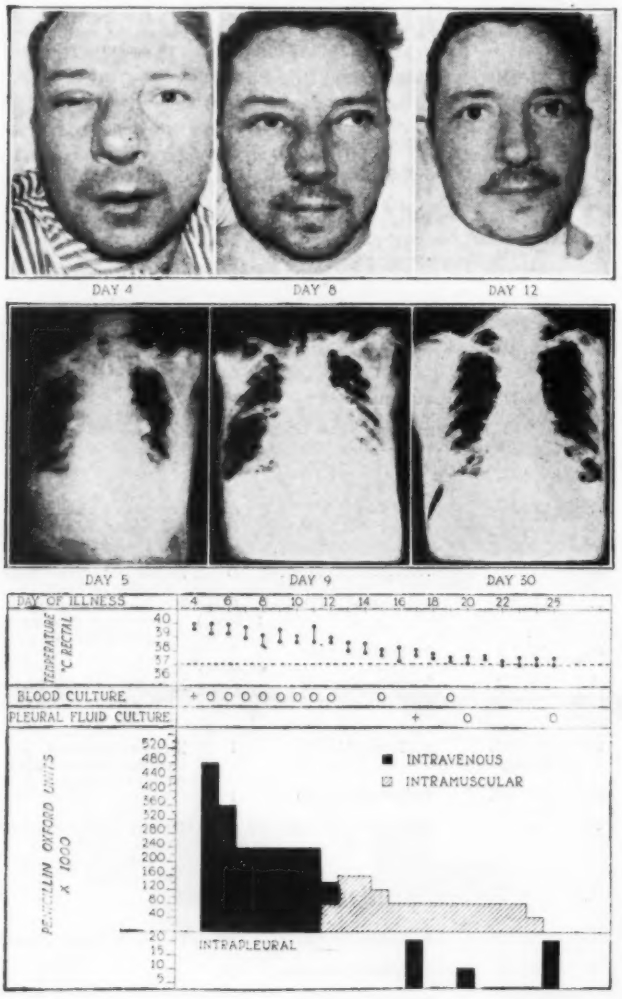

Fig. 2.—Severe staphylococcic infection of face, lungs and pleura.

had developed. An infected pleural effusion was detected on the seventeenth day of illness and was treated with instillation of penicillin into the pleural space together with continued parenteral penicillin therapy. The patient's recovery was complete after twenty days of penicillin treatment.

CASE 8.—*History.*—A. Y., a girl aged 2 years, entered St. Louis Children's Hospital [6] after an acute onset of fever and vomiting six days before. On the day preceding admission her right ankle became swollen, red and tender, and she was given 1.75 Gm. of sulfathiazole. When first seen in the hospital she was semistuporous and was obviously acutely ill. Her temperature was 41 C. (105.8 F.); respirations were labored, and there was pronounced stiffness of the neck. No abnormalities of the heart or lungs were noted on either physical examination or fluoroscopy. The tip of the spleen was just palpable, and there were signs of acute inflammation in the region of the right ankle. The leukocyte count was 15,000, with many young forms noted in the differential count. X-ray films of the right ankle showed only delayed development of centers of ossification. The spinal fluid was normal. Culture of the blood showed 212 colonies of hemolytic Staphylococcus aureus per cubic centimeter. On entry the patient was given 1.2 Gm. of sodium sulfapyrazine, but on the following day pustules were noted over the entire body, the patient was comatose and sulfonamide treatment therefore was replaced by penicillin therapy (fig. 3). On the same day, incision of the ankle revealed an abscess adjacent to the os calcis but there was no osteomyelitis.[7] Culture of the exudate showed hemolytic Staphylococcus aureus, and penicillin was applied to the wound on a gauze dressing. On the ninth day of the disease a pericardial friction rub was heard, and on the following day fluoroscopy showed enlargement of the heart. On this day the liver became palpable, and there appeared edema of the lower extremities. By the eleventh day the child was more alert, but pulsations of the heart were no longer visible under the fluoroscope. On the fifteenth day 105 cc. of turbid fluid containing hemolytic Staphylococcus aureus was removed from the pericardial cavity and penicillin was injected directly into the pericardial sac. This procedure was repeated on subsequent days until sterile straw colored fluid was obtained. The patient's condition gradually improved, and her course in the hospital thereafter was uneventful except for a short bout of fever associated with transient diarrhea. When seen one hundred and thirty-one days after the onset of her illness she was apparently completely well.

Summary.—A girl aged 2 years with severe staphylococcic bacteremia, an abscess of the heel, multiple pustules of the skin and staphylococcic pericarditis made a complete recovery following surgical drainage of the abscess and intensive systemic and local penicillin therapy.

CASE 10.—*History.*—W. H., a schoolboy aged 13 years, jumped from a tree and complained shortly thereafter of pain in the right hip. He felt poorly during the next two days and by the fourth day became semicomatose, with a fever of 40.8 C. (105.4 F.). He was sent to a hospital in western Missouri, where an x-ray plate of the hip showed no destruction of bone but culture of the blood disclosed hemolytic Staphylococcus aureus. He was given sulfathiazole with an initial dose of 1 Gm. followed by 0.5 Gm. every four hours. In spite of this therapy the temperature of 38 to 41 C. (100.4 to 105.8 F.) persisted and he remained in coma. When first seen in the Barnes Hospital, his lungs were clear and his heart was normal except for a systolic murmur at the apex. Neither spleen nor

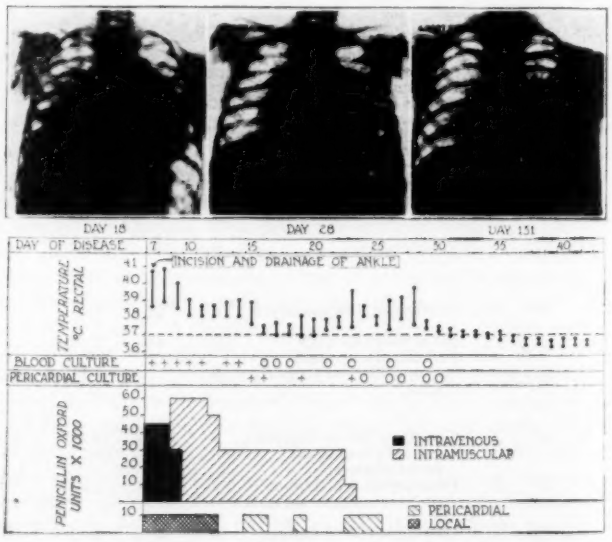

Fig. 3.—Staphylococcic pericarditis responds to drainage and penicillin.

liver was palpable. The right thigh was swollen, and passive motion of the leg caused pain. There were also swelling and slight redness of the right ankle. The leukocyte count was only 11,500, but there were many young forms seen in the differential count. X-ray films of the hip, thigh and ankle showed no lesions of the bone, but the blood contained 140 colonies of hemolytic Staphylococcus aureus per cubic centimeter

6. This case is reported through the courtesy of Dr. Alexis Hartmann.

7. The operation was performed by Dr. Peter Heinbecker.

and therapy with penicillin was begun immediately (fig. 4). Although the patient's condition improved and roentgenograms of the hip on the twelfth day failed to show osteomyelitis, both the fever and the bacteremia persisted. Three hundred and fifteen thousand units of penicillin in twenty-four hours was therefore administered, and thereafter the fever subsided and

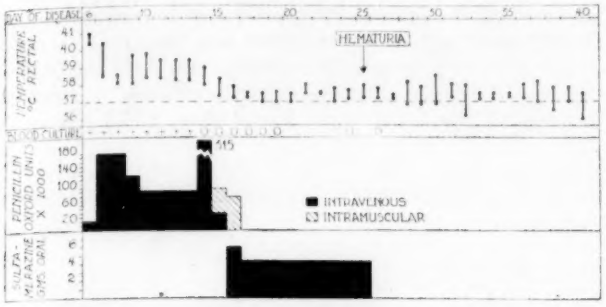

Fig. 4.—Treatment of patient with acute osteomyelitis.

bacteria could no longer be cultured from the blood. By the sixteenth day the patient had apparently recovered, but the supply of penicillin was exhausted; hence sulfamerazine was administered to prevent a possible recurrence of the infection. Hematuria was noted on the twenty-fifth day, but it subsided when sulfamerazine was discontinued. There followed a toxic psychosis of short duration, and on the twenty-ninth day x-ray films revealed evidence of osteomyelitis near the right sacroiliac joint. A low grade fever occurred on the forty-first day of illness, but it subsided promptly after a short course of sulfathiazole treatment. When seen eighty-eight days after the onset of his illness the patient was apparently well and roentgenograms showed healing of the focus of osteomyelitis.

Summary.—A schoolboy aged 13 years with acute osteomyelitis of the ilium entered the hospital in coma resulting from severe bacteremia. Slight clinical improvement resulted from penicillin administered in the usual doses, but fever and bacteremia persisted. Only after massive doses of the drug were given over a period of twenty-four hours did the patient recover. Because the supply of penicillin became temporarily exhausted, sulfonamide therapy was later resorted to in order to prevent possible recurrence of the infection.

CASE 21.—*History.*—F. A., a girl aged 14 years, suffered an infection of the upper respiratory tract two weeks before admission to the hospital. Two days before entry she complained of severe left frontal headache and noted low grade fever and swelling of the left eyelid. When first seen in the hospital she appeared to be acutely ill with fever and edema of the left side of the face, including the eyelids. The nasal mucosa was swollen, and purulent discharge was draining from the nose. An x-ray film revealed opacity of the left maxillary sinus. The only other significant condition observed on admission was the presence of slightly dilated retinal veins in both fundi. The patient had received sulfathiazole before admission and was given sulfamerazine in the hospital, the blood level reaching 11.4 mg. per hundred cubic centimeters. On the fifth day of illness a small incision was made in the left upper eyelid.[8] No pus was obtained, but culture of the serosanguineous material recovered showed hemolytic Staphylococcus aureus. The same organism was cultured from the nose. On the following day there was noted proptosis of the left eye with severe limitation of motion and swelling of the left eyelids (fig. 5). The right eyelids also were swollen, and although there were no demonstrable signs of meningitis and the blood was sterile on culture, a diagnosis of probable thrombophlebitis of the left cavernous sinus was made. Sulfonamide therapy was discontinued, and the patient was given penicillin, as shown in figure 5. Her condition steadily improved, and the fever fell by lysis. The patient's recovery was complete except for slight residual weakness of the left superior oblique muscle.

8. The operation was performed by Dr. A. C. Stutsman.

Summary.—A girl aged 14 years with left maxillary sinusitis complicated by staphylococcic cellulitis of the face and orbit and probably thrombophlebitis of the left cavernous sinus failed to respond to sulfonamide chemotherapy but made a rapid recovery when given penicillin.

Pneumococcic Infections.—Eighteen patients with pneumococcic infections were treated with penicillin. The results of treatment are summarized in table 2. Among the 9 patients with pneumococcic meningitis treated with penicillin there was only one death. The 1 patient who failed to recover was an infant aged 7½ months who had been suffering with meningitis for twenty days before treatment was instituted.

Six patients with pneumococcic pneumonia were treated with penicillin and 2 died. The first patient who failed to recover was a man aged 72 with pneumonia of eight days' duration. He died within twenty-four hours of the onset of treatment. The second fatality was that of a man aged 45 admitted to the hospital with uremia apparently due to sulfonamide nephritis. Death occurred after two days of treatment.

The results of penicillin treatment in 3 cases of empyema were inconclusive. The drug was injected directly into the pleural space. In 2 cases surgical drainage of the empyema was eventually deemed necessary, and in the third case, in which surgical intervention was not required, culture of the pleural fluid was

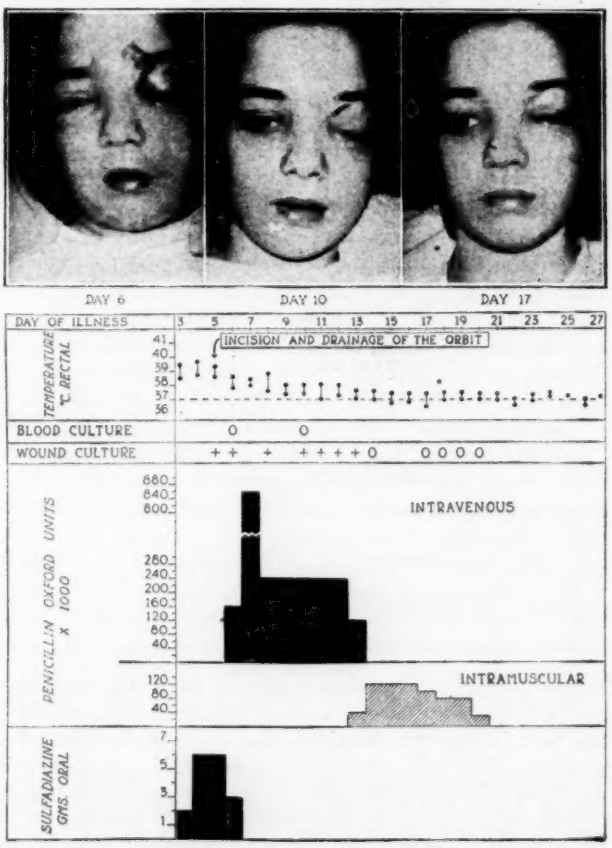

Fig. 5.—Cellulitis of face and sinusitis responds to penicillin.

sterile before penicillin treatment was begun although pneumococci had been seen in the stained sediment.

Abstracts of 2 of the cases of pneumococcic meningitis are presented:

CASE 37.—*History.*—T. H., a woman aged 60, became ill with pain in the right ear and a purulent aural discharge two months before she entered the hospital. These symptoms per-

sisted for one month, at the end of which time she began to complain of tinnitus and vertigo. Forty-eight hours before admission to the hospital she became acutely ill with fever, headache and finally coma. When first examined she had a temperature of 40.6 C. (105.1 F.). The right ear drum was thickened and wrinkled, and a small amount of purulent discharge was noted in the external auditory canal. The external rectus muscle of the right eye was apparently paralyzed, and there was horizontal nystagmus with the quick component to the left. The neck was stiff, and both Kernig and Brudzinski signs were positive. The leukocyte count was 36,900, and type 3 pneumococci were grown from the blood on culture. A abscess of the petrous bone was drained. At operation the lateral sinus was examined but was not opened. Following the operation penicillin was applied directly to the operative wound at daily intervals.

The patient improved rapidly, the course being shown in figure 6. The intrathecal administration of penicillin was stopped on the ninth day. Four days later there was a recurrence of the meningitis, although the blood culture remained sterile. Intrathecal treatment with penicillin was immediately resumed, and larger doses were again employed intravenously. On the fourteenth day the operative wound was again explored and a thrombus was found in the lateral sinus, which was opened

TABLE 2.—*Pneumococcic Infections*

Case No.	Age	Sex	Diagnosis	Type	Blood Culture	Duration of Disease, Days	Penicillin Treatment: Total Dosage, Units × 1,000,000	Penicillin Treatment: Days of Therapy	Penicillin Treatment: Body Wt., Kg.	Penicillin Treatment: Routes of Administration	Other Specific Treatment	Results	Comment
37	60	♀	Mastoiditis; petrositis; meningitis; lateral sinus thrombosis	3	+	2	1.37	18	..	IV, IM, IT, locally	Mastoidectomy; ligation of lateral sinus; sulfadiazine (A)	R	Relapse when dosage reduced due to lateral sinus infection
38	18	♀	Mastoiditis; meningitis	3	+	1	1.66	12	67	IV, IM, IT, locally	Sulfadiazine (B); mastoidectomy	R	Uneventful
39	50	♂	Mastoiditis; meningitis	3	0	3	2.32	15	75	IV, IM, IT, locally	Sulfamerazine (B); mastoidectomy	R	Uneventful
40	42	♀	Pneumonia; meningitis	7	+	3	3.33	16	..	IV, IM, IT	Sulfadiazine (B)	R	Stiff neck; moderate deafness and diplopia with 20 cells in spinal fluid on 23d day
41	44	♀	Meningitis	19	+	5	1.41	7	..	IV, IM, IT	Sulfamerazine (B and A); mastoidectomy	R	Uneventful
42	7½ mo.	♂	Pneumonia; meningitis	1	0	20	0.58	7	92	IV, IT	Sulfapyrazine (B); serum (B)	R	Cortical destruction and hydrocephalus at autopsy
43	50	♀	Mastoiditis; meningitis	8	+	1	3.368	28	73	IV, IM, IT	Mastoidectomy	R	Relapse when penicillin discontinued; uneventful recovery on further treatment
44	14	♂	Meningitis	1	0	3	0.275	7	65	IM, IT	Sulfadiazine	R	Meningitis under control on entry; treated because recurrent
45	17	♂	Meningitis	22	+	3	3.270	21	75	IV, IT	Sulfonamide	R	
46	43	♂	Pneumonia	1	+	6	1.30	7	66	IV, IP	Sulfamerazine (B and A)	R	Severe alcoholic addict
47	56	♂	Pneumonia; sulfonamide azotemia; perirenal abscess	5	+	2	1.31	14	53	IV, IM	Drainage of abscess	R	NPN reached 148; course prolonged; carcinoma of the kidney discovered later
48	79	♂	Pneumonia	1	+	3	3.325	18	..	IV, IM	Sulfamerazine (B)	R	Bacteremia on 2d and 3d days of illness; arteriosclerotic heart disease
49	79	♂	Pneumonia; bronchiectasis of right upper and left lower lobe	3	0	3	1.430	11	65	IM	.....	R	Right lower and middle lobectomy 6 months before present illness
50	72	♂	Pneumonia	Untyped	+	8	0.120	1	..	IV	Sulfadiazine (B)	D	Treated less than 24 hours; pneumococci not obtained at autopsy
51	45	♂	Pneumonia; sulfonamide azotemia	Untyped	0	5	0.340	2	..	IV	Sulfonamide (B)	D	All lobes of lung involved; no organism at autopsy
52	51	♂	Empyema	1	0	17	0.070	5	..	IP	Sulfonamide (B); open drainage	I	Exudate became sterile with penicillin but required drainage
53	20	♂	Empyema	5	0	6	0.035	4	..	IP	Sulfamerazine and serum	R	Culture of pleural fluid negative before penicillin
54	52	♂	Empyema	7	+	34	4.240	19	50	IM, IP	Sulfadiazine (B); thoracotomy	I	

lumbar puncture was performed, and the spinal fluid was turbid and was obviously under increased pressure. Compression of the right jugular vein failed to cause a rise in the spinal fluid pressure. The cell count on the spinal fluid was 2,400 cells per cubic millimeter, of which 95 per cent were polymorphonuclear leukocytes. Type 3 pneumococci were identified in the fluid by the direct quellung reaction. A stained smear of the spinal fluid sediment showed approximately 8 diplococci for each leukocyte. The concentration of sugar in the cerebrospinal fluid was 8 mg. per hundred cubic centimeters. X-ray studies of the right mastoid and petrous bones (fig. 6) revealed evidence of mastoiditis and destruction of bone in the region of the petrous apex. Penicillin therapy was begun immediately by both intravenous and intrathecal routes, and on the second day of treatment a radical mastoidectomy was performed [9] and an and packed with penicillin. The right internal jugular vein was ligated in the neck. For several days small amounts of spinal fluid drained through the operative wound, but thereafter the patient made a rapid recovery. Penicillin was applied locally to the operative wound, which healed rapidly without evidence of infection.

Summary.—A woman aged 60 with otitis media, mastoiditis, meningitis, bacteremia and an abscess of the petrous bone, all due to the type 3 pneumococcus, responded promptly following mastoidectomy, drainage of the petrous abscess and intensive penicillin therapy. On the thirteenth day of her illness, however, there was a recurrence of the meningitis. A second operation was performed, at which the lateral sinus was opened and packed and the external jugular vein ligated in the neck. Following the second operation and further intensive penicillin therapy the patient promptly recovered.

9. By Dr. T. E. Walsh.

CASE 38.—*History.*—R. T., a girl aged 18 years, had had frequent attacks of headache and pain in the right ear since childhood. For five years she had had intermittent otorrhea. Three weeks before she was admitted to the hospital she noticed drainage from her right ear and complained of pain in and behind the ear. Fifteen hours before her admission to the

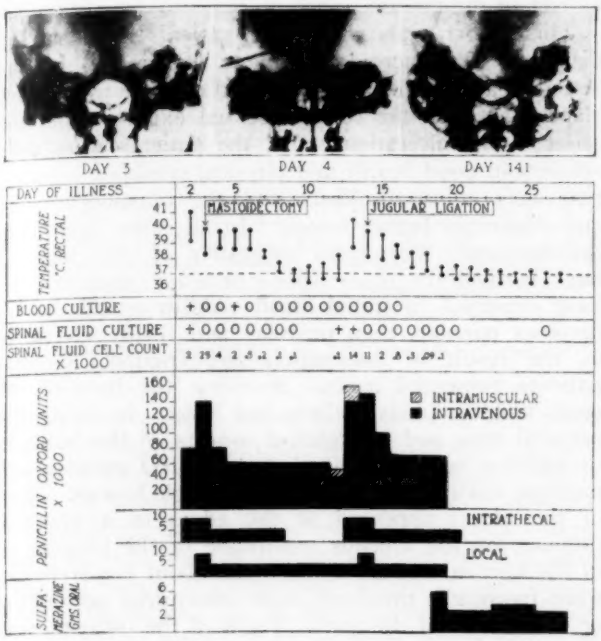

Fig. 6.—Pneumococcic mastoiditis and meningitis.

hospital she was seized with a severe headache and soon fainted. Although she promptly regained consciousness, the severe headache continued and she gradually became delirious. When first examined, her temperature was 39 C. (102.2 F.) and she was drowsy and difficult to arouse. There was a small amount of greenish yellow discharge from the right ear, and the right

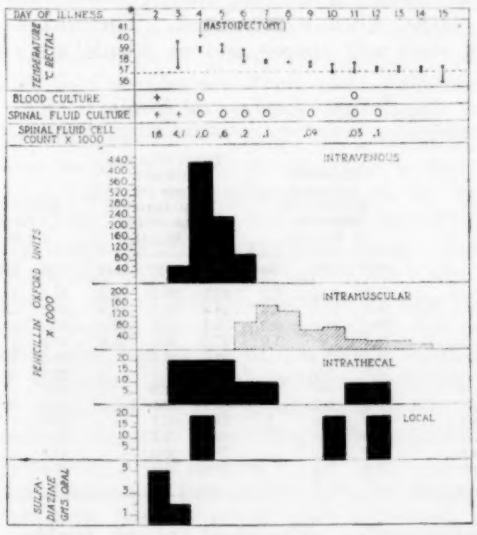

Fig. 7.—Chronic otitis media and meningitis from pneumococcus.

drum was perforated in two places and was of a dull red. Her neck was stiff, and the Kernig and Brudzinski signs were positive. There was a leukocytosis of 18,250 and a type 3 pneumococcus was cultured from the blood. The spinal fluid was cloudy and contained 1,670 polymorphonuclear leukocytes per cubic millimeter. Although no bacteria were seen on smear of the spinal fluid sediment, the type 3 pneumococcus was discovered in the fluid by culture. When second lumbar puncture was performed twelve hours later gram positive diplococci, identified as type 3 pneumococci, could be seen in the spinal fluid and the cell count had risen to 4,700. An x-ray film of the right mastoid region showed increased density of the mastoid cells with destruction of bony trabeculae. When the patient first entered the hospital she was given sulfadiazine, but this therapy was discontinued on the second hospital day and penicillin treatment was begun. The drug was given intravenously and intrathecally, as shown in figure 7. On the fourth day of illness a simple mastoidectomy was performed [10] and, although granulation tissue and friable bone were found at operation, cultures of the tissue were sterile. Following the operation the meningitis subsided rapidly, and the patient had no further difficulty.

Summary.—A girl aged 18 years who gave a history of chronic otorrhea for five years was admitted to the hospital with chronic otitis media, mastoiditis and a meningitis due to the type 3 pneumococcus. Following intensive penicillin therapy and a simple mastoidectomy she recovered promptly in spite of the fact that her illness was complicated by bacteremia.

(To be continued)

MANAGEMENT OF CHANCROID IN A TROPICAL THEATER

REPORT OF 1,555 CASES

MAJOR E. M. SATULSKY
MEDICAL CORPS, ARMY OF THE UNITED STATES

Chancroid, or ulcus molle, is an acute, inflammatory, destructive ulcer characterized by very slight induration and moderate pain on palpation. It is caused by venereal inoculation with Hemophilus ducreyi and occurs usually on the genitals or the surrounding skin. Other areas may also be involved, usually as a result of autoinoculation.

The causative agent was first described by Augusto Ducrey in 1889 and is found in the purulent discharge from the surface of the lesions. It is a small nonmotile, non-spore bearing, non-acid fast, gram negative bacillus measuring from 1 to 2 microns in length and about 0.5 micron in thickness. It appears as a short rod and may be arranged in pairs, groups or chains lying parallel to one another. Several other forms may be assumed including a parallel "school of fish" arrangement. It may be intracellular or extracellular in position.

Variations in staining characteristics have been described by various workers, and numerous methods have been devised for culturing the organisms. The most recent method is described by Dienst,[1] who concluded that a medium containing defibrinated rabbit blood, cystine, dextrose and beef infusion agar is best suited for the purpose and found that the bacillus grows best at 28 to 32 C., with a certain amount of moisture necessary for growth on the surface of the medium.

INCIDENCE

The Surgeon General's Reports [2] indicate that there were 39,044 primary admissions for chancroid in the Army in 1917-1918 and that they comprised 11 per cent of the total of the more common venereal diseases.

10. By Dr. A. C. Stutsman.

The department surgeon supplied the statistics.
Read in part before the Isthmian Medical Society, June 20, 1944.
Captains A. Paul and William Halpern rendered valuable assistance in this study.

From the Medical Service, Section of Dermatology and Syphilology, 210th General Hospital.

1. Dienst, R. B.: New Preparation of Antigen for Intracutaneous Diagnosis of Chancroidal Infection, Am. J. Syph., Gonor. & Ven. Dis. **26:** 201-203 (March) 1942.

2. Chancroidal Infection, in Ireland, M. W.: Medical Department of the United States Army in the World War, Washington, D. C., Government Printing Office, 1928, vol. 9, chapter 7, p. 287.

Primary admission of all venereal disease patients between April 1917 and December 1919 was 86.6 per thousand annually, or 10.2 per cent of the total admissions to army hospitals.[3] In the United States in 1918 the rate for enlisted troops is shown in table 1.[4]

Turner and Sternberg[5] state that during recent months the rate of venereal infection in the Army has been below peacetime levels and less than half that recorded during World War I. They also state that, among troops stationed in the United States, chancroidal lesions comprise about 6 per cent of all cases of venereal disease. An examination of the statistics in table 3 will reveal that in this area chancroid comprised 38.66 per cent of all venereal diseases in 1942 and 27.25 per cent in 1943. This disease presents a more serious problem in this area than in the zone of interior.

TABLE 1.—*Rate of Syphilis, Gonorrhea and Chancroid for Enlisted Troops in the United States in 1918*

	White	Colored	Ratio W/C
Syphilis	18.83	129.90	1:6.90
Gonorrhea	78.07	514.68	1:6.58
Chancroid	4.98	44.5	1:8.94

TABLE 2.—*Diagnoses Made in 2,240 Enlisted Troops*

1. Chancroid	1,555
2. Syphilis (all types)	317
3. Ulcers, penile, cause and type undetermined	133
4. Lymphopathia venereum	19
5. Lymphadenitis, inguinal, cause undetermined	45
6. Balanitis, nonspecific	30
7. Herpes progenitalis	15
8. Miscellaneous	126
Total	2,240

Greenwald,[6] at a post in the United States where the ratio of colored soldiers to white is about 1 to 5, reports 73 colored to 3 white primary admissions during a nine month period, with a ratio of approximately 120:1. In a series of 175 patients, Kornblith and his co-workers[7] report 127 Negroes, 44 white persons, 3 Puerto Ricans and 1 Chinese. Rauschkolb[8] reports a 66 per cent colored incidence in civilian clinic practice.

In the Panama Canal Department, where there were relatively few colored soldiers, the high percentage of chancroidal infections in white soldiers is significant. While there is a decided variation from month to month, it is readily seen that the trend has been precipitously down since May 1943 (charts 1 and 2). The dramatic reductions in the total venereal disease rate and also in the chancroid rate are the results of a vigorous and sustained campaign waged by the medical officers of this department under the guidance and auspices of the surgeon. This campaign has stressed one thing above all others: adequate and thorough prophylaxis. That such prophylactic measures are effective for all venereal diseases, and chancroid to an even greater extent than the others, has been conclusively proved.

The incidence of clinical chancroidal infection in females is much less frequent than in males. There is evidence that the Ducrey bacillus may exist in the female genitalia as a saprophyte and when transplanted to other tissues may then become a pathogen. Levin[9] has stated that the female may act as a symptomless carrier of the disease.

This report deals with 1,555 patients in whom the diagnosis of chancroid was made (table 2). In this series an average incubation period of three to ten days elapsed between the time of sexual exposure and the onset of the ulcerations. All the patients were male soldiers in good health and physical condition. Sixty-two were colored soldiers and the remainder white and American Indian troops. In all cases there were definite penile ulcerations suggestive of chancroid. I have verified the observations of many workers who have reported an initial small reddish macule which becomes papular, then pustular and finally ulcerative as the result of maceration and friction. Several patients presented lesions involving the base of the penis and the pubis; others had lesions involving the perineal area and intergluteal aspects of the buttocks in addition to the penile lesions; 1,160 patients had multiple lesions and 390 presented single lesions. Most of the ulcers appeared at the edges of a phimotic prepuce, on the mucous membrane of the prepuce or in the coronal sulcus. The areas about the frenulum were frequently involved, with subsequent perforation or destruction of this part. Eight of the patients were circumcised and presented lesions on the frenulum and in the coronal sulcus. These are the areas apparently subjected to the greatest trauma during the sexual act.

Clinically, a chancroidal infection is manifested by the appearance of ragged, irregular, slightly indurated ulcerative lesions covered with a variable amount of yellow-gray purulent material. This pellicle wipes off easily and reveals a necrotic, dirty, granular base which bleeds easily when manipulated. The ulcers are of various sizes and shapes and as a rule are circinate or ovoid in outline. The edges are soft, friable, slightly indurated and irregular and may be slightly undermined. A reddened inflammatory and slightly edematous areola is usually present. The ulcers spread by coalescence and peripheral extension; they are inoculable and autoinoculable. The high percentage of multiple lesions in this and other series of cases is apparently due to the autoinoculability. There is

TABLE 3.—*Venereal Disease*

	Chancroid, Rate per Thousand Annually by Months			Total Venereal Disease Rate per Thousand Annually by Months			Percentage of Chancroid by Months		
	1942	1943	1944	1942	1943	1944	1942	1943	1944
January	21.2	30.7	1.0	45.0	68.7	25.5	45.6	44.7	4.1
February	19.6	17.8	1.6	48.8	50.2	18.8	40.1	35.4	8.7
March	10.8	12.1	0.9	33.1	52.5	22.9	33.1	37.0	3.7
April	16.7	19.2	1.9	47.3	50.8	25.0	32.9	37.7	7.6
May	11.6	27.3	....	42.9	60.1	....	28.0	45.5	....
June	12.9	9.9	....	61.0	43.7	....	23.2	22.8	....
July	30.0	7.6	....	81.7	41.9	....	36.7	18.1	....
August	30.4	6.7	....	87.1	32.9	....	34.8	20.5	....
September	35.6	5.6	....	74.3	32.1	....	48.0	17.6	....
October	36.0	6.8	....	75.5	33.5	....	47.9	20.4	....
November	36.6	4.9	....	78.8	29.0	....	47.8	16.8	....
December	33.9	2.3	....	73.8	22.3	....	45.9	10.5	....

3. Pappas, J. P.: Venereal Disease Problem, United State Army, Mil. Surgeon **93:** 172 (Aug.) 1943.
4. Report of the Surgeon General of the United States Army, Washington, D. C., Government Printing Office, 1919, pt. 1, pp. 955-959.
5. Turner, T. B., and Sternberg, T. H.: Management of the Venereal Diseases in the Army, J. A. M. A. **124:** 133 (Jan. 15) 1944.
6. Greenwald, E.: Chancroidal Infection, J. A. M. A. **121:** 9 (Jan. 2) 1943.
7. Kornblith, B. A.; Jacoby, A., and Chargin, L.: Chancroid: Treatment with Sulfathiazole and Sulfanilamide, J. A. M. A. **117:** 2150 (Dec. 20) 1941.
8. Rauschkolb, J. E.: Circumcision in Treatment of Chancroidal Lesions of Male Genitalia: Further Observations, Arch. Dermat. & Syph. **39:** 319 (Feb.) 1939.
9. Levin, E. A.: Diagnosis of Chancroid, Urol. & Cutan. Rev. **45:** 587 (Sept.) 1941.

usually unilateral or bilateral swelling of the inguinal lymph nodes, which may be very tender and painful on walking or on palpation. Fifty-six per cent of the patients showed this involvement. Those with advanced cases who were transported over long distances to this hospital showed fever, much discomfort and malaise. Several cases showed spontaneous rupture of inguinal nodes and others presented evidence of recent incisions for drainage. These cases all showed evidences of

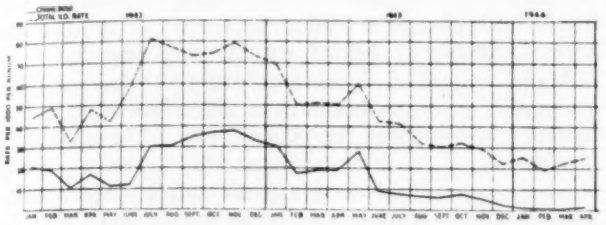

Chart 1.—Graphic representation of rate per thousand annually by months of chancroid and total venereal disease.

secondary infection. In most of the cases the lymph nodes were enlarged approximately to the size of a small walnut. They were firm, elastic, movable, slightly tender on palpation, not matted and nonsuppurative. The overlying skin in these cases was normal. More advanced cases showed inflammation of the skin, matting and acute inflammation of the lymph nodes, extreme tenderness and variable degrees of softening. The lymphatic swellings in the groin which later gave rise to abscesses are commonly spoken of as "buboes."

DIAGNOSIS

The diagnosis of chancroid was made on clinical grounds alone after laboratory procedures were used to eliminate complicating diseases, particularly syphilis. A diagnosis of chancroid should not be made, despite the typical clinical picture, until primary syphilis has been ruled out. Each patient, on admission, was put to bed and warm continuous saline compresses were applied to the affected areas. A minimum of three daily dark field studies for Treponema pallidum were made; some cases were studied for longer periods before syphilis was differentiated from chancroid. In lesions due to both diseases the diagnosis is more difficult. Each patient with enlargement of the inguinal nodes was tested with chick embryo antigen (Frei test) before the diagnosis of chancroid was made. Serologic tests for syphilis (Wassermann and Kahn) were done on admission and at weekly intervals in two separate laboratories during the hospitalization of the patient. Because of the possibility of coexistent syphilis, all military personnel in this department with the diagnosis of chancroid have a serologic test for syphilis performed at monthly intervals for three months following discharge from hospitals.

Various laboratory procedures for the diagnosis of chancroid have been reported and advocated in the literature. These include the Ito-Reenstierna skin test and the staining or cultural isolation of the Ducrey bacillus. Several workers have stated that they consider these procedures the most reliable single factors in the precise diagnosis of chancroid.

The Ito-Reenstierna test is a reaction to Ducrey vaccine injected intradermally. The original vaccines employed killed Ducrey organisms. Cole and Levin [10] described an intracutaneous test for chancroidal infection using sterilized pus from a bubo prepared like the antigen for the Frei test. Sanderson and Greenblatt [11] described the preparation from a culture of a vaccine for the skin test. An accepted commercial vaccine is now available. There is disagreement as to the time intervals between the appearance of the infection clinically and the response of the skin to the vaccine. Reports vary from six days to five weeks for the development of this allergic response of the skin.[12]

A positive reaction after the intradermal injection of 0.1 cc. of vaccine is supposed to mean a present or a past healed chancroidal infection. The Suttons [13] state "It does not mean that the sore of the patient at the time of the test is certainly chancroid or is only chancroid." It has been stated, however, that a negative test dependably rules out a chancroidal infection. Some workers advocate the use of this test and report high percentages of positive results. Greenwald [6] reports positive skin tests in three fourths of the 75 cases he observed. Kornblith [7] states that the reaction was positive and specific in 95 per cent of his 175 cases but adds that the test is more important when the results are negative to exclude active chancroidal disease. The permanence of the skin test together with its false positives and negatives must always be kept in mind.

Some workers [7] have stated that the identification of the Ducrey bacillus on smears stained with the Unna-Pappenheim method (methyl green pyronine) was found to be the most important single diagnostic criterion. They report the identification of the organism in 88.5 per cent of the cases in routine smears. Others, using the ordinary Gram stain, found the smears to be positive in 65 per cent of the cases.[6]

It is probable that other strains of streptococci may produce ulcerations morphologically identical with chancroidal infections. The Suttons [14] stated "It is probable that some chronic destructive chancroidal lesions are actually microaerophilic streptococcic ulcers." Turner and Sternberg,[5] in discussing chancroid infections, state that, since diagnostic methods usually available are often none too reliable, it is possible that more than one etiologic entity is being encountered. They state further that more clinical and bacteriologic studies on this problem are needed. Knott and his associates [15] report

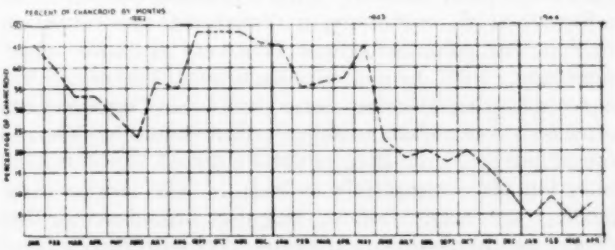

Chart 2.—Graphic representation of chancroid by months.

10. Cole, H. N., and Levin, E. A.: Intradermal Reaction for Chancroids with Chancroidal Bubo Pus, J. A. M. A. **105**: 2040 (Dec. 21) 1935.

11. Sanderson, E. S., and Greenblatt, R. B.: Cultivation of Hemophilus Ducreyi and Preparation of Antigen for the Intracutaneous Diagnosis of Chancroidal Infection, South. M. J. **30**: 147 (Feb.) 1937.

12. Becker, S. W., and Obermayer, M. E.: Modern Dermatology and Syphilology, Philadelphia, J. B. Lippincott Company, 1940, p. 350. Speiser, M. D.: Infectious Lesions About External Genitals with Special Emphasis in Diagnosis, Am. J. Obst. & Gynec. **43**: 681 (April) 1942. Dulaney, A. D.: Use of Ducrey Vaccine in Diagnosis, Am. J. Syph., Gonor. & Ven. Dis. **21**: 667 (Nov.) 1937.

13. Sutton, R. L., and Sutton, R. L., Jr.: Diseases of the Skin, ed. 10, St. Louis, C. V. Mosby Company, 1939, p. 973.

14. Diseases of the Skin, p. 972.

15. Knott, L. W., and others: The Differential Diagnosis of Lymphogranuloma Venereum and Chancroid by Laboratory and Skin Tests, Am. J. Syph., Gonor. & Ven. Dis. **27**: 657 (Nov.) 1943.

that the results of the diagnostic skin tests for chancroid should be interpreted with caution. A positive reaction does not necessarily establish the diagnosis nor a negative reaction exclude it. The best criterion in the differential diagnosis of chancroid remains the clinical appearance of the lesions. The skin reactions are at best of confirmatory value and do not alone suffice to establish a diagnosis.

The Surgeon General of the United States Army states [16] that the laboratory tests for the diagnosis of chancroid (Ito-Reenstierna skin test or the staining or cultural isolation of the Ducrey bacillus) are not recommended.

Pursuant to these instructions, the diagnosis of chancroid in this series was not made on laboratory findings or skin tests but was made on clinical grounds after other laboratory procedures were used to rule out other diseases or mixed infections. The diagnosis of "ulcers, penile, cause and type undetermined" was made on small, atypical superficial ulcerations which healed rapidly under saline compresses while dark field examinations were being done.

THERAPY

Sulfonamide therapy has become the therapeutic method of choice in the treatment of chancroidal infections. Before its advent various local and systemic measures were advocated and used. These included various types of local applications, the administration of foreign proteins, vaccines, arsenicals, roentgen rays and many other forms of therapy. Local surgical procedures and cauterizations with electrical and chemical means were employed for many years. The sulfonamides have greatly reduced the duration of the disease, complications have been avoided and tissue destruction with extensive scarring have been reduced to a minimum. Circumcisions and other operative procedures are strictly avoided during the acute phases of the disease and have not been found necessary or advisable in this series. During surgical manipulations the infection may be transmitted by means of dressings, towels and instruments. Rauschkolb [8] found autoinoculations along the lines of incision in a series of 247 patients treated routinely with circumcision. After an adequate trial of therapy, a dorsal slit was necessary in 6 of our patients because of severe phimosis which interfered with proper drainage and therapy. We agree with those workers who state [7] that "circumcision after a cure of a chancroidal infection should be deferred for at least two or three months after all signs of local infection have completely subsided. The risk of poor healing or reactivation of sluggish organisms in the depths of the tissues if operation is performed earlier is always present."

In cases with soft, fluctuant, suppurative inguinal glands incisions and drainages were not performed. The affected areas were cleaned thoroughly with warm water and soap and painted with 3.5 per cent tincture of iodine and alcohol. A small cannula was inserted firmly into the point of maximum softening. In some cases ethyl chloride was used as a spray for local anesthesia. The pus was aspirated with a syringe through the cannula, aided with slight manual pressure when necessary. After all the pus was evacuated, 1 to 1.5 cc. of 7 per cent tincture of iodine was instilled into the cavity through the cannula left in situ. This caused a moderate degree of temporary burning in some patients, while others tolerated it without complaints. A pressure bandage was applied following removal of the cannula and the patient kept at bed rest for the following three to four days. During this time there is drainage of an iodine stained semipurulent serum and clumps of purulent material through the small opening in the skin. With the removal of the infected material the pain and discomfort of the patient cease almost immediately and the fever begins to subside. In five to seven days the area is completely healed without any sequelae.

Many types of local medications were used in attempting to discover the most efficacious combination of drugs to instil into the gland cavity. These included insufflation of various sulfonamide powders, sulfonamide powders in glycerin, thymol iodide powder, iodoform powder, solutions of thymol iodide and iodoform, azochloramide in triacetin 1 : 500 and balsam of Peru. The instillation of 7 per cent tincture of iodine has given us excellent results in all cases in which it was employed.

It has been our practice to avoid local and systemic therapy while the dark field examinations are being done. We have found that warm saline compresses if adequately applied are sufficient to clean local lesions prior to dark field study. After syphilis has been ruled out by a sufficient number of negative examinations, local therapy is instituted. This consists of thorough washing with warm water and white soap twice a day and careful drying of the affected parts. Powdered sulfanilamide is dusted on liberally and a loose dressing applied. This is repeated twice daily until the lesions heal. In patients with a tight phimosis and underlying ulcerative lesions, the phimotic preputial cavity is irrigated twice daily with a small hand syringe using a warm 1 : 5,000 potassium permanganate solution. In small superficial chancroidal lesions local therapy alone may suffice. Where indicated clinically oral sulfonamide therapy is employed simultaneously. For larger, burrowing, deep and secondarily infected ulcerations systemic administration of sulfonamides by mouth was necessary immediately.

Oral systemic therapy consisted of sulfathiazole 1 Gm. (15 grains) four times a day for five days followed by 0.5 Gm. (7½ grains) four times a day for ten days. This is a total intake of 40 Gm. (600 grains) in fifteen days. In attempting to determine the most efficient regimen of therapy, other sulfonamides were used. Sulfanilamide may be used in doses of 1 Gm. (15 grains) three times a day for five days followed by 0.6 Gm. (10 grains) four times a day for ten days. Sulfadiazine was used in doses of 1 Gm. (15 grains) four times a day for five days followed by 0.5 Gm. (7½ grains) four times a day for ten days. The latter drug was discontinued, because at the time this study was made cases of anuria were reported in the literature following its use and several cases occurred in this hospital. There were no complications from the concomitant use of local and systemic sulfonamide therapy. There were no major toxic reactions to the oral administration of the various sulfonamides. Some patients had nausea, vomiting and mild attacks of dizziness. Cyanosis of the lips and finger nail beds was noted in a few instances. Dermatitis medicamentosa manifested by urticarial, erythematous and scarlatiniform eruptions

16. Diagnosis and Treatment of the Venereal Diseases, Circular Letter No. 74, July 25, 1942, paragraph 5.

and by erythema nodosum lesions was also found. Each patient was carefully observed daily for untoward symptoms or signs of toxicity. Toxic reactions were found more commonly with sulfanilamide than with sulfathiazole. There were no cases of anuria, hematuria or dysuria. In 22 cases these drugs were discontinued by mouth because of persistent nausea, vomiting or a sudden decrease in the white blood cell counts. In 10 additional cases with gastrointestinal upsets the drugs were tolerated without complaint when administered with sodium bicarbonate 10 grains (0.6 Gm.) with each dose. Fluids were forced on all patients receiving oral sulfonamide therapy. Blood counts and urinalyses were done on admission. At three day intervals checks were made on the hemoglobin, white blood cell count and the urine of each patient. Sulfonamide blood levels were not determined.

All lesions healed under the therapy outlined without surgical intervention. Superficial infections healed with local applications of sulfanilamide powder only. Patients were discharged from the hospital to full duty when all lesions were completely healed and epithelized. Small inguinal glands were absorbed and responded well to systemic therapy with sulfonamides, bed rest and ice caps locally.

The average hospitalization of all lesions in this series was 11.2 days. In 1918 the average time lost from duty was 24.9 days.[2]

There were 55 patients who developed subsequent penile lesions and were readmitted to the hospital:

A. Eighteen of these patients presented new lesions which were positive for Treponema pallidum on reexaminations.

B. Thirty-seven patients presented clinical lesions of chancroid.

(*a*) Nine patients have histories of sexual exposures without mechanical or chemical prophylaxis within sixty days despite rigid quarantine.

(*b*) Twenty patients had presented small superficial lesions on the first admission and had received only local therapy.

(*c*) Eight patients had received local and oral sulfonamide therapy on the first admission but presented chancroidal ulcerations in the original sites and in new areas on readmission.

All these new lesions developed from three to five days after discharge from the hospital to full duty. All patients who were readmitted responded satisfactorily without reactions to further local and systemic sulfonamide therapy.

SUMMARY AND CONCLUSIONS

1. A series of 1,555 consecutive patients with chancroidal infections were treated in an army hospital.

2. All cases in which the clinical diagnosis of chancroid was made responded to local and systemic therapy with a sulfonamide.

3. An efficient method of treatment of inguinal abscesses was developed.

4. Sulfathiazole was found to be the most efficacious drug to be administered orally.

5. The average hospitalization of all cases was 11.2 days.

6. Further clinical and bacteriologic work for the more precise diagnosis of chancroid is necessary.

THE TREATMENT OF PNEUMOCOCCIC MENINGITIS WITH PENICILLIN

LEWIS K. SWEET, M.D.
WASHINGTON, D. C.
EDITH DUMOFF-STANLEY, M.D.
BOSTON
HARRY F. DOWLING, M.D.
WASHINGTON, D. C.
AND
LIEUTENANT MARK H. LEPPER
MEDICAL CORPS, ARMY OF THE UNITED STATES

Pneumococcic meningitis remains as one of the acute infections most difficult to treat successfully. Before the introduction of the sulfonamides it was almost invariably fatal. Even with the very vigorous use of sulfonamides and type specific serums the results have been far from satisfactory. The case fatality rate has been reported to vary from 58 per cent[1] to 80 or 90 per cent,[2] depending on the type of case received in the institution in which the study was made. Since pneumococci are highly sensitive to small amounts of penicillin, and since this agent is very effective in pneumococcic pneumonia,[3] much can be expected from its employment in pneumococcic meningitis.[2]

Our purpose in the present report is to detail our experience with the use of penicillin in the treatment of 16 patients with pneumococcic meningitis and to compare the results with those obtained in 40 consecutive patients treated with sulfadiazine or sulfamerazine.

The 56 patients under consideration were treated by us in the wards of the Gallinger Municipal Hospital or in the private practice of one of us between July 1, 1942 and Aug. 1, 1944. Forty patients were treated up to Dec. 20, 1943 with either sulfadiazine or sulfamerazine, with the addition of type specific antipneumococcic serum in 21 cases. The sulfonamide was started immediately after the spinal fluid obtained at the initial puncture had demonstrated the presence of the purulent meningitis or, in a number of instances, when the patient was admitted for the treatment of pneumonia before there was evidence of meningitis. The serum was given intravenously as soon as the type was known. In 13 of the patients the serum was given immediately because organisms could be typed directly from the initial spinal fluid. In 8 additional patients serum was given later after typing was completed or when the specific type of serum was obtained. The dose of serum varied from 65,000 to 825,000 units, with 15 of the 21 patients who were given serum receiving between 300,000 and 600,000 units.

Since Dec. 20, 1943, when penicillin became available to us, we have treated 16 patients. They received the

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Lieutenant Lepper, of San Antonio, Texas, made his contribution to this paper before entering the Army of the United States.

From the Infectious Disease Service and the George Washington Medical Division, Gallinger Municipal Hospital, and the Departments of Pediatrics and Medicine, George Washington University.

The penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for clinical investigations recommended by the Committee on Chemotherapeutics and Other Agents of the National Research Council.

1. Hodes, H. L.; Smith, Margaret H. D., and Ickes, H. J.: Sixty Cases of Pneumococcic Meningitis Treated with Sulfonamides, J. A. M. A. **121**: 1334-1337 (April 24) 1943.

2. Dingle, J. H., and Finland, M.: Diagnosis, Treatment and Prevention of Meningococcic Meningitis, with a Résumé of the Practical Aspects of Treatment of Other Acute Bacterial Meningitides, War Med. **2**: 1-58 (Jan.) 1942. Dowling, H. F.; Dauer, C. C.; Feldman, H. A., and Hartman, C. R.: Pneumococcal Meningitis: A Study of Seventy-Two Cases, New England J. Med. **226**: 1015-1018 (June 25) 1942.

3. Tillett, W. S.; Cambier, Margaret J., and McCormack, J. E.: The Treatment of Lobar Pneumonia and Pneumococcal Empyema with Penicillin, Bull. New York Acad. Med. **20**: 142-178 (March) 1944.

same basic supportive care and in addition were given the sodium salt of penicillin either with or without sulfadiazine or sulfamerazine. Two patients also received antipneumococcic serum.

These two groups of patients have been compared on the basis of the following prognostic factors: (1) the age of the patient, (2) the site of the primary lesion leading to meningitis and (3) the number of organisms found in the first spinal fluid obtained after the onset of the meningitis. As shown in table 1, these groups are strikingly similar when examined in this way. In

TABLE 1.—*Comparison by Age, Primary Lesion and Number of Organisms in the Original Specimen of Cerebrospinal Fluid of Patients with Pneumococcic Meningitis Treated with Sulfonamides and Those Treated with Penicillin*

	Sulfonamide Group, Number Treated	Penicillin Group, Number Treated	Total Number Treated
Age:			
Under 10	6	2	8
10 to 39	8	3	11
40 and over	26	11	37
Primary lesion:			
Pneumonia	15	4	19
Otitis media and/or mastoiditis	4	2	6
Endocarditis	4	1	5
Head injury	2	1	3
Unknown	7	5	12
None	8	3	11
Number of pneumococci in initial cerebrospinal fluid:			
Sufficient for typing	30	12	42
Rare	7	3	10
Not recorded	3	1	4
Total	40	16	56

TABLE 2.—*Comparison by Age, Primary Lesion and Number of Organisms in the Original Cerebrospinal Fluid of the Results of Treatment of Pneumococcic Meningitis with Sulfonamides and with Penicillin*

	Sulfonamide Group		Penicillin Group		Total	
	Number Treated	No. Died	Number Treated	No. Died	Number Treated	No. Died
Age:						
Under 10	6	5	2	0	8	5
10 to 39	8	8	3	0	11	8
40 and over	26	24	11	9	37	33
Primary lesion:						
Pneumonia	15	13	4	3	19	16
Otitis media and/or mastoiditis	4	4	2	0	6	4
Endocarditis	4	4	1	1	5	5
Head injury	2	2	1	0	3	2
Unknown	7	7	5	5	12	12
None	8	7	3	0	11	7
Number of pneumococci in initial cerebrospinal fluid:						
Sufficient for typing	30	29	12	8	42	37
Rare or absent	7	5	3	0	10	5
Not recorded	3	3	1	1	4	4
Total	40	37	16	9	56	46

each group approximately two thirds of the patients were 40 years of age or over. It is well known that the prognosis is worse in these older patients.

Pneumonia was the most frequent primary lesion detected, being present in 38 per cent of the sulfonamide group and in 25 per cent of the penicillin group. Endocarditis was present in 10 and 6 per cent of the two groups respectively, and head injuries in 5 and 6 per cent. No antecedent focus was demonstrated, because the patient was too critically ill on admission to give a satisfactory history, in 18 and 31 per cent of the two groups respectively. When meningitis originates from any of these primary sites, or when the patient is too ill for the primary lesion to be discovered, the outlook is usually very poor. In only 30 and 32 per cent of the respective groups was the meningitis primary or secondary to an otitis media or mastoiditis, with the relatively good prognosis that can be offered in such cases. Furthermore, the more organisms present in the initial specimen of spinal fluid, the poorer the prognosis. We found that in 75 per cent of each group there were a sufficiently large number of organisms in this specimen to allow immediate direct typing by the Neufeld technic. Therefore, according to all these criteria, these two groups were for the most part composed of patients whose illness was very severe and whose prognosis was poor, the general severity of the illness being as unfavorable in one group as in the other.

When we consider the results of the two types of treatment, however, there is a definite difference (table 2). Among the 40 patients treated with sulfonamides there were only 3 recoveries, whereas among the 16 patients who received penicillin there were 7 recoveries. All 3 patients who recovered under the older method of therapy had very mild cases of meningitis. They were never very toxic or completely comatose. In 1 of these patients there were sufficient organisms for Neufeld typing from the initial spinal fluid, but the pneumococci were not numerous; in 2 patients the organisms were demonstrated on culture only.

The patients who received penicillin are presented in detail in table 3. They are grouped in accordance with the concomitant treatment employed with penicillin and according to the route of administration of penicillin. The first 3 patients received penicillin both intrathecally and intramuscularly and received no sulfonamides. One patient (patient 3) recovered. This patient, a Negro woman aged 45, had severe meningitis secondary to mastoiditis. Her mastoid was drained surgically and she was given very large doses of penicillin intrathecally twice daily for a week. Her spinal fluid became sterile but a pronounced pleocytosis persisted, the dextrose level was very low, the patient's fever remained high and her general condition remained poor. Intramuscular penicillin was then started, and the patient immediately began to improve.

The second group of 5 patients (4 to 8 inclusive) received intrathecal penicillin and sulfamerazine or sulfadiazine. There were 3 recoveries in this group. The meningitis in 1 of these 3 patients was primary and in the others was secondary to pneumonia and to otitis media. Penicillin was given in doses of 10,000 to 15,000 units twice daily for from three to ten days, then daily for periods of from twelve to thirty-two days. The average blood sulfonamide level for the 3 patients was approximately 14 mg. per hundred cubic centimeters. The meningitis in these 3 patients was relatively less severe than the average of the group. Furthermore, in none of them were organisms present in adequate numbers for immediate typing. Accordingly, while it is highly improbable that all of them would have recovered on sulfonamide therapy alone, we cannot assume that the choice of therapeutic agents used in their treatment is the optimal one for all cases.

The remaining 8 patients received penicillin both intrathecally and intramuscularly and also received sulfonamides. Three patients recovered. One was a Negro woman aged 29, who had a severe meningitis without evident antecedent focus. She received intrathecal penicillin for twenty-seven days and then, after evidence of a neurologic lesion developed (which will be discussed

later) was given intramuscular penicillin for an additional seven days. As the meningitis was essentially well when the intrathecal penicillin was discontinued, this patient might be considered as another patient cured by penicillin intrathecally in combination with sulfamerapenicillin intrathecally and intramuscularly for forty-six and forty-eight days respectively. During this time there were several periods of remission of the disease, but on each occasion a reduction of the dosage of penicillin was followed by an immediate exacerbation

TABLE 3.—*Analysis of Sixteen Patients with Pneumococcic Meningitis Treated with Penicillin*

Case No.	Race	Sex	Age	Primary Lesion	Type of Pneumococci	Penicillin: Intrathecal Dose †	Frequency	Time	Total Dose †	Penicillin: Parathecal * Dose †	Frequency	Time	Total Dose †	Other Treatment	Outcome and Comment
1	W	♀	50	Pneumonia	7	40	q 12 h.	30 h.	120	30	q 3 h.	30 h.	300	None	Died
2	W	♂	67	Unknown	29	25	.....	Once	115	30	q 3 h.	51 h.	755	None	Died
						10	Twice d.	4½ d.		25	q 3 h.	9 h.			
										10	q 3 h.	42 h.			
3	C	♀	45	Mastoiditis	3	40	Twice d.	7½ d.	980	0	.....	6 d.	3,420	None	Recovered
						20	Twice d.	2½ d.		30	q 3 h.	8 d.			
						40	Daily	7 d.		20	q 3 h.	7½ d.			
										15	q 3 h.	2½ d.			
4	C	♂	48	Pneumonia	7	15	.....	Once	215	..	.....	.....	.....	Sulfamerazine B. L. 14	Recovered
						10	Twice d.	1 d.							
						15	Twice d.	2 d.							
						15	Once d.	8 d.							
5	C	♂	48	Unknown	7	10	.....	Once	10	..	.....	.....	.....	Sulfadiazine B. L. 14	Died
6	W	♀	13	Otitis media	18	10	Twice d.	5½ d.	200	..	.....	.....	.....	Sulfamerazine B. L. 14	Recovered
						10	Once d.	9 d.							
7	W	♂	48	Unknown	25	10	Twice d.	4½ d.	290	..	.....	.....	.....	Sulfamerazine B. L. 10	Died
						10	Daily	3 d.							
						10	Twice d.	5 d.							
						10	Daily	7 d.							
8	C	♂	31	None	29	10	Twice d.	10 d.	565	..	.....	.....	.....	Sulfamerazine B. L. 15	Recovered
						20	Daily	1 d.							
						10	Twice d.	1 d.							
						20	Daily	12 d.							
						15	Daily	3 d.							
						10	Daily	5 d.							
9	C	♀	1½	Head injury	6	10	Daily	11 d.	670‡	20 IV.	Stat.	Once	.....	200,000 units type 6 antipneumococcic serum. Sulfadiazine started on 46th day of treatment B. L. 13	Recovered but had mental deterioration
						5	Daily	5 d.		2.5 IV.	q 1 h.	8 h.	40 IV.		
						0	.....	2 d.		15 IM.	q 3 h.	21½ d.	10,210 IM.		
						5	Daily	6 d.		10	q 2 h.	37¼ d.			
						0	.....	1 d.		10	q 3 h.	21 d.			
						10	Daily	2 d.		5	q 2 h.	2½ d.			
						0	.....	1 d.		5	q 3 h.	5 d.			
						5	Daily	1 d.							
						10	Daily	48 d.							
10	W	♀	2 mo.	None	12	25	Daily	1 d.	1,465‡	20 IV.	Stat.	Once	20 IV.	200,000 units type 12 antipneumococcic serum. Sulfadiazine started on 48th day of treatment B. L. 12-14	Recovered but had mental deterioration
						15	Twice d.	3 d.		15 IM.	q 3 h.	5½ d.	12,620 IM.		
						15	Daily	10 d.		10	q 3 h.	1 d.			
						0	.....	1 d.		15	q 3 h.	15 d.			
						15	Daily	11 d.		10	q 2 h.	38 d.			
						0	.....	1 d.		10	q 3 h.	2¼ d.			
						15	Daily	4 d.		15	q 3 h.	4 d.			
						7.5	Daily	2 d.		10	q 2 h.	39 d.			
						15	Daily	11 d.		5	q 2 h.	3 d.			
						10	Daily	2 d.							
						15	Daily	49 d.							
						10	Daily	3 d.							
						5	Daily	2 d.							
11	W	♀	62	Unknown	8	30	Daily	2 d.	60	50 IV.	.....	Once	50 IV.	Sulfadiazine B. L. 9.5	Died
										20 IM.	q 3 h.	19 h.	140 IM.		
12	W	♀	75	Pneumonia	8	10	q 12 h.	2 d.	40	30	q 3 h.	24 h.	240	Sulfadiazine B. L. 23	Died
13	C	♀	29	None	12	20	Twice d.	10 d.	1,270	0	.....	27 d.	1,740	Sulfamerazine B. L. 12	Recovered
						15	Twice d.	1½ d.		30	q 3 h.	7¼ d.			
						20	Daily	1 d.							
						15	Twice d.	1 d.							
						20	Twice d.	1 d.							
						20	Daily	4 d.							
						20	Twice d.	6 d.							
						40	Twice d.	3½ d.							
14	C	♂	45	Endocarditis	12	15	Twice d.	4½ d.	300	0	.....	10 d.	1,290	Sulfamerazine B. L. 12	Died suddenly of heart disease after the meningitis had cleared
						15	Daily	11 d.		30	q 4 h.	7 d.			
15	C	♂	45	Pneumonia	18	20	q 12 h.	Once	40	30	q 3 h.	9 h.	120	Sulfamerazine B. L. 2.4	Died
						10	q 12 h.	2 doses							
16	C	♂	42	Unknown	3	30	.....	Once	30	20	q 2 h.	10 h.	120	Sulfadiazine B. L. not done	Died

* Parathecal penicillin was given intramuscularly unless otherwise stated
† Dosages of penicillin expressed in thousands of Oxford units.
‡ Almost all of this penicillin was given into the lateral cerebral ventricles.
Symbols: B. L., average blood level of sulfonamide expressed in milligrams per cent; q 3 h., every three hours; IV., intravenously; IM., intramuscularly; h. hours; d., days or daily.

zine. Two of the patients who recovered were infants. In 1 the primary lesion was a head injury. This was complicated first by a pneumonia and bacteremia, then by meningitis. In the other infant the meningitis was a primary infection. Both infants received large doses of penicillin intrathecally and intramuscularly for forty-six and forty-eight days respectively. During this time there were several periods of remission of the disease, but on each occasion a reduction of the dosage of penicillin was followed by an immediate exacerbation of the meningitis. Thereafter a combination of sulfadiazine and penicillin was used for forty-one and sixty days respectively. Both infants recovered, but not until after pronounced cerebral atrophy with resultant mental deterioration had developed. Of the other 5 patients

in this last treatment group, 4 died within twenty-four hours after the institution of treatment, and 1 died of endocarditis after his meningitis had cleared completely.

Reactions that apparently derived from the intrathecally injected penicillin have been encountered in 4 of the patients treated by this method. They have been of two types, mild sensory changes and severe sensory and motor changes. Both types of lesion have involved the lower segments of the spinal cord or the roots of the lumbosacral plexus of nerves. The mild sensory changes occurred in 2 patients, 4 and 8, and consisted of pain in the legs, and in patient 8 pain in the back also during the intrathecal administration of penicillin. The symptoms appeared on the tenth and twenty-third days after the institution of intrathecal penicillin therapy, persisted until the penicillin dosage was reduced or discontinued and then disappeared.

The severe reactions also occurred in 2 patients who had prolonged intrathecal penicillin treatment. Patient 3 developed severe pain in the legs and toes during the intrathecal administration of penicillin, beginning on the tenth day of therapy. By the seventeenth day there was urinary retention with overflow. The presence of a hypotonic bladder was verified by cystometrogram. The intrathecal penicillin was then discontinued, the symptoms began gradually to abate, and the patient was discharged completely recovered sixty-three days after entry. The other patient, 13, had a severe type 12 pneumococcic meningitis without definite primary lesion. She received penicillin intrathecally twice each day. On the tenth day she began to complain of intense pain in the legs with each intrathecal injection. On the eighteenth day lumbar punctures became impossible because of spasm of the muscles of the back. Thereafter the penicillin was given into the cisterna magna for ten more days. During this time the patient developed a hypotonic neurogenic bladder, verified by cystometrogram, and paralysis of both legs, with pronounced hyperesthesia and absent tendon reflexes. On the twenty-eighth day the intrathecal penicillin was discontinued and the drug was given intramuscularly in large doses for one week. The patient made a very gradual recovery from her neurologic lesion and was discharged one hundred and twenty-four days after entry, with almost complete recovery from her neurologic lesion.

In 1 patient, 7, an attempt was made to secure better diffusion of the intrathecal penicillin by giving it alternately into the cisterna magna and lumbar subarachnoid space. The cerebrospinal fluid became bloody after twelve days, at which time the patient became deeply comatose. The patient died on the nineteenth hospital day. Although the autopsy showed a purulent exudate over the cerebral cortex, the most significant findings were a large blood clot filling the cisterna magna and numerous puncture holes in the meninges over the medulla. There were meningeal adhesions just below the cisterna magna.

It is probable that the cerebral atrophy and mental deterioration encountered in cases 9 and 10 were due to the meningitis, but they may possibly have been due to the penicillin, since much of that drug was given directly into the lateral ventricles.

COMMENT

Few reports on the use of penicillin in the treatment of groups of patients with pneumococcic meningitis have appeared in the literature. The reports that are available [4] tend to minimize the severity of this infection and to indicate that its treatment with this drug is relatively simple. Working in a clinic where the majority of patients with pneumococcic meningitis are 40 years of age or over and where the meningitis usually is a complication of some other serious infection, we have found that such an attitude is not and probably never will be tenable. The inherent severity of the disease is evidenced by the fact that of our 16 patients treated with penicillin 6 died within forty-eight hours after the treatment was begun. Of those patients who recovered, in only 2 were we able to discontinue treatment successfully within two weeks, and in 5 it was continued for twenty-four, thirty-two, thirty-four, eighty-seven and one hundred and eight days. In 3 of these patients and in 1 of the 3 patients who died after surviving for periods longer than two days an exacerbation of the meningitis occurred almost immediately after a premature reduction of the penicillin dosage.

This brings up a question that to us has been very perplexing. When can penicillin be discontinued with safety? At present we are unable to give a satisfactory answer. We have had patients with no fever whose spinal fluid findings were essentially within the normal range for as long as four days, who nevertheless showed an exacerbation when the dosage of the drug was reduced. Therefore we are strongly inclined to continue the drug for considerable periods after the clinical evidences of infection have subsided.

Our preference for this course, however, is tempered by the apparent reactions to intrathecal penicillin that we have seen. It is impossible from our present data to determine whether these reactions are due entirely to the action of penicillin itself, to certain impurities present along with the drug, to repeated lumbar punctures or to the meningitis. Such reactions were seen very rarely in meningococcic meningitis treated with intrathecal serum [5] and were thought to be due to the meningitis rather than to the repeated spinal punctures. Since the initial symptoms in our patients accompanied the administration of penicillin, and since the severity of the symptoms increased in proportion to the duration of therapy after the onset of the complication, it seems probable that the reactions were due to the irritant effect of the penicillin itself or of the impurities present with it.

As a result of these severe reactions, and as a result of our difficulty in terminating penicillin therapy in 2 patients (9 and 10), we feel that in the treatment of pneumococcic meningitis the patient should be given the benefit of large doses of either sulfadiazine or sulfamerazine as well as penicillin intramuscularly or intravenously at the rate of 200,000 or more Oxford units per day, so that intrathecal penicillin therapy may be reduced to a minimum. In this way the intrathecal dosage can probably be kept as low as 10,000 to 20,000 Oxford units per day. In order to reduce the irritation further, this dose should be diluted in 20 to 30 cc. of isotonic solution of sodium chloride if it is possible to administer this much fluid intrathecally. The amount

4. Dawson, M. H., and Hobby, Gladys L.: The Clinical Use of Penicillin: Observations in One Hundred Cases, J. A. M. A. **124**: 611-622 (March 4) 1944. Keefer, C. S.; Blake, F. G.; Marshall, E. K.; Lockwood, J. S., and Wood, W. B.: Penicillin in the Treatment of Infections: A Report of Five Hundred Cases, ibid. **122**: 1217-1224 (Aug. 28) 1943. Rosenberg, D. H., and Arling, P. A.: Penicillin in the Treatment of Meningitis, ibid. **125**: 1011-1017 (Aug. 12) 1944. Cairns, H.; Duthie, E. S.; Lewin, W. S., and Smith, H. V.: Pneumococcal Meningitis Treated with Penicillin, Lancet **1**: 655-659 (May 20) 1944.

5. Blackfan, K. D.: Treatment of Meningococcic Meningitis, Medicine **1**: 139-212 (May) 1922. Worster-Drought, C., and Kennedy, A. M.: Cerebrospinal Fever: The Etiology, Symptomatology, Diagnosis, and Treatment of Epidemic Cerebrospinal Meningitis, London, A. & C. Black, Ltd., 1919.

of fluid administered, however, must always be from 5 to 15 cc. less than the amount of cerebrospinal fluid withdrawn. Finally, intrathecal penicillin should be discontinued as soon as the patient shows a continuing favorable reaction, while parathecal penicillin and sulfonamides should be continued for several days more.

SUMMARY AND CONCLUSIONS

1. Sixteen patients with pneumococcic meningitis were treated with penicillin (with or without sulfonamides) with nine deaths. Among 40 patients treated with sulfonamides and no penicillin there were thirty-seven deaths. The two groups were shown to be very similar as regards the factors which are important in evaluating the prognosis.

2. The duration of treatment with penicillin varied from twelve to one hundred and eight days in the recovered patients.

3. Two patients developed mild and 2 developed severe neurologic symptoms associated with the administration of the penicillin. All of these patients recovered before leaving the hospital.

4. It is concluded that the optimal treatment of pneumococcic meningitis should include the use of penicillin and sulfadiazine or sulfamerazine. The penicillin should be given both intrathecally and systemically.

PYELOCYSTOSTOMOSIS

REPORT OF TWO CASES

ELMER HESS, M.D.
ERIE, PA.
AND
B. W. WRIGHT, M.D.
NASHVILLE, TENN.

It is often necessary to divert the urinary stream while an obstructive lesion is corrected. This, in reality, is one of the fundamental principles of certain surgical procedures on the urinary excretory apparatus. The obstructive untreated uropathies will eventually destroy the renal parenchyma. If the obstruction can be relieved in whole or in part after a definitely increasing nephrosis is discovered, the recovery of the renal parenchyma is one of the amazing features of the convalescent period.

No matter how badly damaged the renal parenchyma may seem to be, none of these cases are necessarily hopeless, even if a single renal mass is the only renal substance that can be found. We have all seen cases in which life has been indefinitely prolonged, with normal blood chemistry balance and only infinitesimal amounts of glomerular tissue clinging to the renal capsule. Equally if not more amazing is the ability of a nephrotic kidney to assume normalcy, or near normalcy, after the complete relief of obstruction. Often, however, the condition of the patient does not warrant an immediate attack on the obstruction itself. It is therefore expedient to short-circuit the urine until recovery of the renal function assures some chance for success. Temporary procedures to bring the urine to the surface of the body have been devised and used by all of us. Occasionally certain conditions arise in which obstructions above the bladder may be relieved by such a short-circuiting within the body. This should be preferable. In these situations anomalous organs must be handled with discretion, and this is more important when the patient has only a single renal mass, whether this mass is a solitary, a fused or a horseshoe kidney.

In these cases the very life of the patient depends on the diagnostic ability, skill, experience and ingenuity of the urologic surgeon. If a surgical procedure can be planned that would temporarily sidetrack the urinary stream within the body, bypassing the obstruction, then one operation might suffice and the renal function might be indefinitely prolonged.

Many successful attempts to reimplant ureters into the bladder have been reported, but only 2 cases are now on record in which the hydronephrotic renal pelvis has been successfully anastomosed directly to the urinary bladder to bypass permanently a ureteral obstruction. The first time this operation was performed it was a "must" at the operating table. Necessity in this case proved to be the mother of invention. The second case was deliberately planned and successfully executed and these 2 cases, we believe, are unique in the annals of urologic surgery. The operations about to be described open a new avenue of approach to the treatment of certain types of nephrosis.

In 1929 one of us reported a very unusual experience. Faced with a huge hydronephrosis in the left half of a horseshoe kidney which could not be relieved by cystoscopy, an operation was created at the operating table which was designated pyelocystostomosis. The successful relief of the condition was completely reported before the meeting of the American Urological Association in 1929. Herewith are appended the drawings of the technic of this particular procedure and the x-ray examination, postoperatively, showing the patient's fistula between the pelvis of the kidney and the posterior fundal wall of the bladder.

At the time of operation this patient was 9 years of age. He was discharged from the hospital with a most satisfactory clinical result. Fourteen years later, in 1943, the patient, now an adult, was examined by the draft board and told the draft surgeon such a fantastic story that he was sent back to the clinic for confirmation and advice.

Prior to his operation in 1929 the boy had not been too bright but since operation had improved immeasurably, mentally, and had completed his required school work and was now employed in a defense plant. His story was that he had been in good health ever since and had developed as any normal boy. At the time of his examination he was perfectly well, with normal urinary output and control and had no symptoms. He did refuse cystoscopy and so check-up pyelograms are not available. His argument was Why go through a very disagreeable examination when he was in perfect health? Here, then, is a man who has lived for fourteen years following a procedure that, to the best of our knowledge, had never previously been done.

In 1943 a second case in which a similar situation existed, except that the kidney was a solitary one, came under the care of the co-author of this paper.

The patient, aged 42, was married and the father of 1 child. A diagnosis of hydronephrosis in a congenital ectopic solitary kidney was made. The condition was relieved the first time by ureteral catheterization. Three weeks later the patient again had an acute hydronephrosis and 6 ounces of urine was drained out of this hydronephrotic pelvis, with complete relief of symptoms. Thirteen days after this second admission a third

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William P. Didusch and Miss Margaret North made the drawings illustrating both technics.

attack of hydronephrosis was accompanied by severe colicky pain in the lower part of the abdomen and suppression of urine. The nonprotein nitrogen was 106.0 and the creatinine was 7.2 mg. per hundred cubic centimeters of blood. His blood pressure had risen to 210/110 as compared to 132/94 when he was first admitted to the hospital. He had a severe headache, visual disturbances, vertigo, mental dulness and hiccups, with an obviously pending uremia. Again, cystoscopic ureteral catheterization relieved the hydronephrosis, but on August 16 it was decided to short-circuit the urine

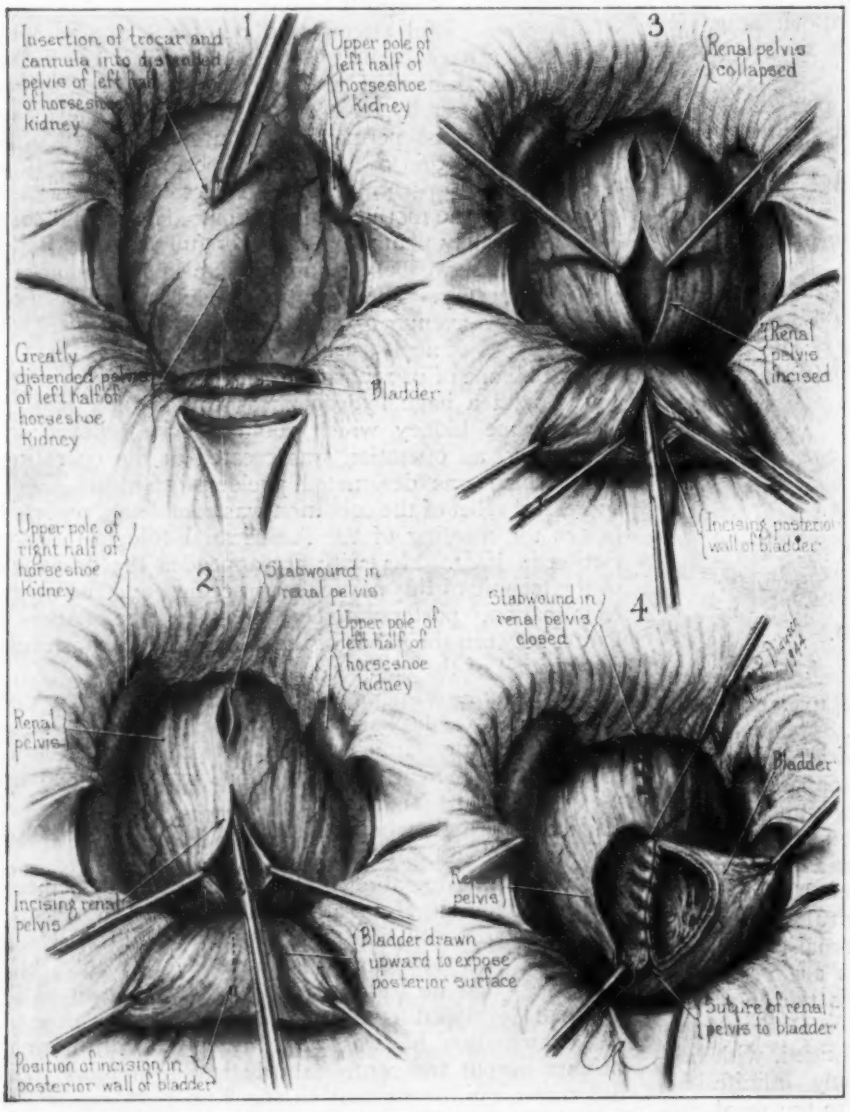
1
Insertion of trocar and cannula into distended pelvis of left half of horseshoe kidney
Upper pole of left half of horseshoe kidney
Greatly distended pelvis of left half of horseshoe kidney
Bladder
Upper pole of right half of horseshoe kidney
2
Stabwound in renal pelvis
Upper pole of left half of horseshoe kidney
Renal pelvis
Incising renal pelvis
Bladder drawn upward to expose posterior surface
Position of incision in posterior wall of bladder
3
Renal pelvis collapsed
Renal pelvis incised
Incising posterior wall of bladder
4
Stabwound in renal pelvis closed
Bladder
Renal pelvis
Suture of renal pelvis to bladder

Fig. 1.—1. Bladder and hydronephrosis exposed through a midline incision. 2. Line of incision in the posterior wall of the bladder and the incision in the pelvis. 3. Relationship of the incision in the posterior wall of the bladder and the nephrotic pelvis. 4. Method of anastomosing the pelvis to the bladder.

by attempting to anastomose the hydronephrotic sac directly to the urinary bladder. The ectopic kidney could be seen and felt beneath the posterior peritoneum, in front of the first portion of the sacrum. A careful search failed to reveal another kidney or a missing testicle. The right ureter was a blind pouch; the left ureter entered the hydronephrotic pelvis on its upper left anterior surface and was sharply angulated at the ureteropelvic junction. The long axis of the kidney was horizontal. The blood supply to the kidney was typical of that seen in ectopias and came from the abdominal aorta.

The posterior parietal peritoneum was incised in the midline and stripped from the kidney and the posterior wall of the bladder. The lower border of the renal pelvis was first attached to the lower part of the posterior wall of the bladder by several interrupted sutures of catgut, the purpose being to protect the anastomosis from undue tension. An extraperitoneal, suprapubic cystostomy was then done, through which the finger was introduced for guidance. Corresponding vertical incisions, each 3.5 cm. long, were made in the bladder and the renal pelvis, and these were sutured together with catgut in the same manner as is employed in a gastrojejunostomy. This produced a communication between the bladder cavity and the interior of the renal pelvis through which the index finger could be easily passed without constriction. The posterior parietal peritoneum was sutured over the united kidney and bladder and the abdominal cavity was then closed without drainage. A Pezzer catheter was sutured in the cystostomy opening with a pursestring of catgut and provided extraperitoneal drainage of the bladder. The wound in the abdominal wall was closed in the usual manner.

The patient made an uneventful recovery, and the wound healed by first intention. The only difference between this operative procedure and the first anastomosis that was done was the drainage of the cystostomy with a Pezzer catheter (in the first case drainage was effected by catheter through the urethra, and the bladder wall was closed by suture). Normal urination was reestablished on the twentieth postoperative day, and the patient was discharged on the twenty-fourth postoperative day with a blood pressure of 116/70.

Four months after his operation the patient resumed his occupation and felt well. His blood pressure had increased to 155/115. One month later examination revealed many pus cells and a heavy trace of albumin in the urine, with a slight rise of afternoon temperature.

At that time cystoscopy showed the stoma to be open, and through it a No. 5 catheter was passed into the kidney and the pelvis was lavaged with 1:5,000 silver nitrate solution. Daily irrigations of the bladder and kidney through a soft rubber catheter in the urethra, using a silver solution, rendered the urine practically pus free after a week, but the urine continued to show some red blood cells and a trace of albumin. A cystogram at this time showed a definite diminution in the size of the kidney pelvis. The blood pressure was 130/90. The blood nonprotein nitrogen was 50 mg. and the creatinine 3.5 mg. The patient left for his home in a neighboring city, feeling quite well and ready for work.

This patient's nitrogen retention remains higher than normal but it is apparently fixed, as there has been

no appreciable change in the past four months. His future is apparently dependent on how well his urinary infection is controlled and whether or not the low grade pyelonephritis is progressive. At present he seems to owe his life to the pyelocystostomy.

COMMENT

It is perfectly feasible, under certain clinical and anatomic conditions, to plan deliberately and execute the direct anastomosis of the renal pelvis and the urinary bladder. If the proper indications are the directive, the operative procedure should be a success and a secondary operation to relieve the obstruction unnecessary. The advantages when such a procedure is practical are obvious, as the drainage of the kidney is within the body to the natural receptacle for the urine and immediately does away with all of the discomforts incident to urinary drainage to the body surface.

The indications for the operation are limited, but it is definitely indicated in large hydronephroses which cannot be relieved by ureteral catheterization and where for one reason or another the remaining renal parenchyma must be preserved. The size and position of the hydronephrotic organ must be such as to make the attempt at anastomosis feasible.

A single pelvic kidney acutely obstructed, a horseshoe kidney one side of which is acutely obstructed, or a single kidney with a huge nephrosis may be handled in this manner and the result will be far more acceptable to the patient than a nephrostomy which is drained through the loin. However, if the nephrotic sac isn't large enough to be easily anastomosed, the nephrostomy will be a far better surgical approach. Then there may be

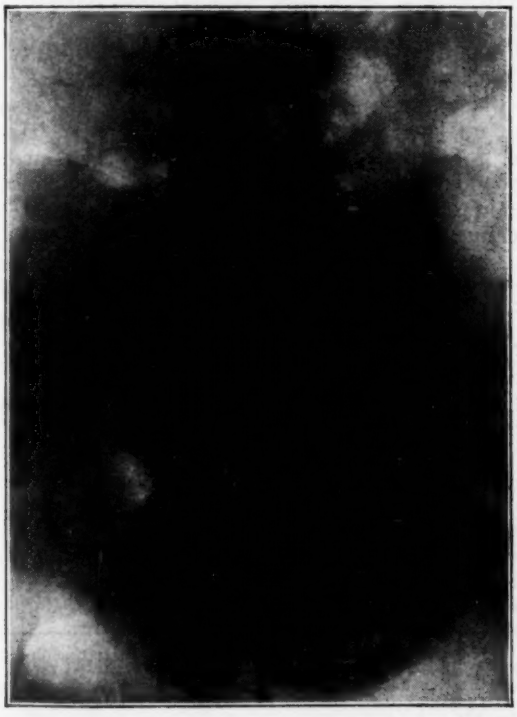

Fig. 2.—Cystopyelogram showing the anastomosis between the bladder and the pelvis of the kidney; anteroposterior view, postoperatively.

several other combinations of conditions that may arise that would make an operation of this kind feasible, even though a normal kidney might be on the opposite side. In each of these cases reported there is a slight difference in operative technic, but in the main they are the same.

Drawings of the technic of both operations are presented for comparison, and we hope that this report of our experiences will stimulate others who, from time to time, are faced with such a problem to attack the situation fearlessly and with full hope of surgical success. In these 2 cases there is demonstrated a new

Fig. 3.—Cystopyelogram showing the anastomosis between the kidney and the bladder; lateral view, postoperatively.

surgical operation. True, its indications are limited; but its value as a life saving procedure has been twice demonstrated. The operation is presented for your consideration as an additional weapon in our struggle to relieve distress and prolong life.

8 East Twelfth Street.

ABSTRACT OF DISCUSSION

DR. EDGAR BURNS, New Orleans: Since drainage is usually defective in such cases, one would expect hydronephrosis to be a frequent lesion. In the records at Charity Hospital in New Orleans I found 12 cases of ectopic kidneys. Two of these patients had dilated renal pelves. The 2 cases reported by Drs. Hess and Wright certainly presented unusual problems. Obviously in the performance of the type of operative procedure they have outlined the principles of plastic surgery must be rigidly adhered to; perhaps the most important of these is freedom from tension. In order to insure adequate drainage it seems desirable to make the anastomosis as large as the size of the renal pelvis and its proximity to the bladder will permit. Otherwise the same situation might develop as is found in a diverticulum of the bladder the opening of which is too small to permit complete emptying. Although these 2 patients were men, the same situation might be encountered in women. The relationship of the uterus to the bladder and the usual site of an ectopic kidney would probably make it more difficult to accomplish the anastomosis in such cases. Even if the anastomosis could be made, the possibility of subsequent disease of the uterus would create a hazard that might prove disastrous in later years. How should the uterus be handled in such cases? From a study of Dr. Hess's case it is apparent that

the normal variations in intravesical pressure have had no influence on renal function, but I should like some comment on that point. Another point is that of obstruction to the urinary outlet. Unquestionably, back pressure would lead to more rapid destruction of renal function than is encountered when the kidneys are in the normal position. This applies especially to men who are liable to develop prostatic hypertrophy. Dr. Wright's patient is approaching that age.

DR. B. W. WRIGHT, Nashville, Tenn.: This patient is intelligent and cooperative, and I have examined him by cystoscope a number of times since the anastomosis was made. The stoma is perfectly visible and patent. It looks like the opening of a diverticulum. I have on several occasions passed a catheter transvesically through the stoma and into the renal pelvis and lavaged it. When this patient's bladder is irrigated through a urethral catheter he is conscious of and easily identifies the sensation of a distended kidney. For the first few months after he was up and about I taught him to manipulate his renal pelvis in the Credé manner, and he found that he could void, and then by pressing on his abdomen he would be able to pass some more urine, which undoubtedly was that retained in his renal pelvis. Now he is no longer able to get this second voiding, and I think it is consistent with the contracture of the pelvis. The obstruction in his case was due to the high implantation and sharp angulation of the ureter and at the operation, when we had two catheters in the ureter and filled the kidney pelvis, it seemed that the more we distended the pelvis the more acute and complete was the obstruction. Just what additional complications and problems will arise if he develops an obstruction at his bladder neck or distal thereto remain to be seen.

PENICILLIN THERAPY IN RAT BITE FEVER

W. A. ALTEMEIER, M.D.
HARRY SNYDER, M.D.
AND
GERTRUDE HOWE, M.D.
CINCINNATI

Rat bite fever is a peculiar and relatively rare disease of man which occasionally develops after the bite of a rat. There is some evidence that this condition has been known in India for two thousand three hundred years and that India may have been its source. Modern medical literature on this subject began with the report of Wilcox in 1840, who recorded a group of symptoms that followed the bite of a rat. Since then case reports have been published in nearly all of the countries of the world, including Asia, Japan, Europe, England, North and South America, Hawaii and Australia. In the United States the disease has now been reported in twenty-eight states and the District of Columbia, but the incidence has been greatest in Ohio, Pennsylvania, New York and Illinois. In spite of its worldwide distribution, an epidemic spread of rat bite fever has never been recorded. It is primarily an invasive wound infection, and this explains its sporadic occurrence.

The wild rat is the chief animal vector, and more rarely the dog, cat, pig, mouse, laboratory white rat and weasel may be the source of infection. Evidence is lacking that the flea or any other insect is concerned in transmission of the infection.

There are at least two distinct types of rat bite fever: (1) "sodoku," shown by Futaki and others to be caused by Spirillum minus (or Spirocheta morsus muris), and (2) septicemia produced by Streptobacillus moniliformis, otherwise known as Haverhillia multiformis or Streptothrix muris ratti.

Sodoku is the endemic Japanese or Oriental form, and cases of this type have been much more prevalent than the streptobacillary type seen in the United States. In fact, we have found reports of only 17 proved cases of rat bite fever produced by Streptobacillus moniliformis.

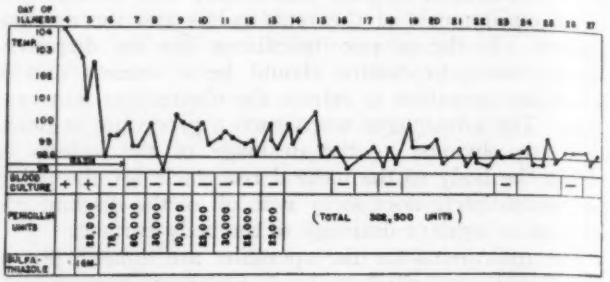

Fig. 1.—Course in case of rat bite fever due to Streptobacillus moniliformis: incubation period, ten days; rash, first six days; local inflammation absent; lymphangitis and adenitis (local) absent; arthritis absent; Kahn reaction negative.

Although it might be expected that the clinical picture would vary according to the etiologic agent, such a clinical differentiation has not been clearly established. The similarities between the two types of rat bite fever have led to their being considered variants of the same disease, and this has led to much confusion. In 1940 Allbritten, Sheely and Jeffers [1] reviewed the accessible literature and indicated certain features that tended to differentiate the spirillar from the streptobacillary form. We have summarized the essential features of the two types in table 2, using data obtained from reported cases and our own experience.

Although it has been shown repeatedly that the spirillar form responds very well to arsenical therapy, particularly with neoarsphenamine and sulfarsphenamine, no satisfactory chemotherapeutic agent has been found for the streptobacillary type. The arsenical compounds have been helpful in some cases and of no value in others. Sulfonamide therapy has also been ineffective.

During the summer of 1943 we had the unusual opportunity of treating with penicillin 3 cases of rat bite fever produced by Streptobacillus moniliformis, and the case reports are recorded:

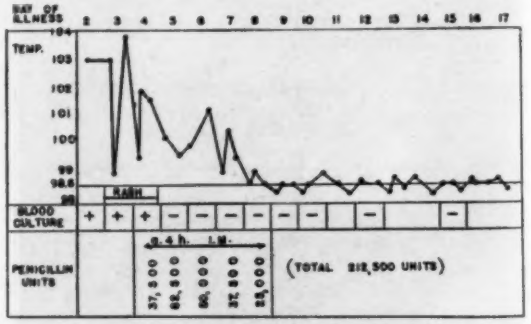

Fig. 2.—Course in case of rat bite fever due to Streptobacillus moniliformis: incubation period, one day; rash slight on third and fourth days; local inflammation mild; local lymphangitis and adenitis mild; history of lymphangitis; arthritis absent; Kahn reaction negative; complication, gastroenteritis.

CASE 1.—A. M., a white girl aged 10 months, admitted to the Children's Hospital on July 1, 1943, two weeks previously had been bitten by a large brown rat on the left hand

From the Department of Surgery, University of Cincinnati, and the Department of Pediatrics of the Children's Hospital. The work described in this paper was done under a contract recommended by the Committee on Medical Research between the Office of Scientific Research and Development and the University of Cincinnati.

1. Allbritten, F. F.; Sheely, R. F., and Jeffers, W. A.: Haverhillia Multiformis Septicemia: Its Etiologic and Clinical Relationship to Haverhill and Rat-Bite Fevers, J. A. M. A. **114**: 2360 (June 15) 1940.

and right foot. Within ten days she developed high fever and a cutaneous rash, which began on the face and spread rapidly over the body and extremities. At the time of admission she was acutely ill and her temperature was 103.6 F. by rectum. A fine red maculopapular rash was distributed generally over the body, including the palms of the hands and soles of the feet. The tooth marks on the hand and foot did not appear inflamed, and there was no regional lymphangitis or lymphadenitis. A mild generalized lymphadenopathy was present, however.

The white blood cell count was 17,500 per cubic millimeter with 62 per cent polymorphonuclears and 38 per cent lymphocytes. The Kahn test and urinalysis were negative.

During the first twenty-four hour period of hospitalization a total of 1 Gm. of sulfathiazole was administered. At this time the blood culture taken on admission was reported positive for Streptobacillus moniliformis. Sulfathiazole therapy was discontinued, and treatment with penicillin was started. At intervals of four hours 12,500 units of sodium penicillin was given intravenously for two and one-half days. For six days thereafter smaller doses of 5,000 units were given intramuscularly, a total of 302,500 units being administered in the eight and one-half days. Twenty-four hours after the onset of penicillin therapy

TABLE 1.—*Essential Features of Spirillar and Streptobacillary Types of Rat Bite Fever*

	Spirillar	Streptobacillary
1. Common geographic location	Orient, Europe	America, Europe
2. Incubation period.....	1-3 weeks	1-3 days usually
3. Bite wound.....	Exacerbation with development of local swelling, pain and purplish red discoloration 1-3 weeks after bite; chancre-like ulcer develops	Usually heals readily
4. Cutaneous rash.....	Usually distinct; large macular or papular; never petechial	Fine maculopapular, morbilliform or petechial; may involve skin of palms (fig. 4)
5. Arthritis.....	Usually absent	Commonly present
6. Regional lymphangitis and lymphadenitis	Present	May be present
7. Blood cultures.....	Negative	Positive for Streptobacillus moniliformis
8. Wassermann reaction.	Usually negative	Negative
9. Kahn reaction.....	Tends to become positive at end of fourth week	Negative
10. Polymorphonuclear leukocytosis	Present	Present
11. Secondary anemia.....	Present	Present
12. Arsenotherapy.....	Prompt response	Little or no response
13. Sulfonamide therapy..	No data	Little or no response

the blood culture was negative and remained so. At the same time the temperature fell sharply, the rash disappeared and the child made a rapid recovery without evidence of relapse, complication or sequela. She was discharged on July 29, 1943 and has had no recurrence (fig. 1).

CASE 2.—R. F., a white boy aged 2 months, was admitted to the Children's Hospital on Aug. 2, 1943 with a history of having been bitten by a large brown rat in several places about the right ankle. Twenty-four hours after the bite he developed high fever and a "red streak" on the injured leg.

On admission the infant appeared acutely ill and had a temperature of 103 F. by rectum. There were tooth marks on the right foot and ankle and a mild inflammatory reaction about them. Regional lymphangitis was present, but the inguinal glands were not enlarged or tender. No rash was present at first, but a few macules were seen on the feet the day following admission.

The white blood cell count was 13,400 per cubic centimeter with 71 per cent polymorphonuclears. The urinalysis and Kahn tests were negative.

Blood cultures taken on the day of admission and the two days following were positive for Streptobacillus moniliformis. Penicillin therapy was started on the third hospital day with 12,500 units of sodium penicillin every four hours intravenously or intramuscularly the first forty-eight hours. Treatment was continued for four and one-half days, a total of 212,500 units being given (fig. 2).

All blood cultures after the start of penicillin therapy were negative, while all before had been positive. The rash disappeared within twenty-four hours, and the temperature fell gradually during the following three days. The temperature

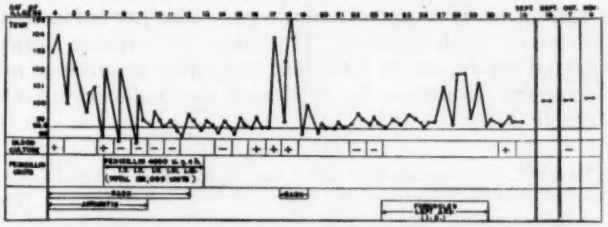

Fig. 3.—Course in case of rat bite fever due to Streptobacillus moniliformis: incubation period, three days; local inflammation slight; regional lymphangitis questionable; Kahn reaction negative.

response may have been influenced in part by the development of diarrhea, which seemed to have no relation to the therapy. The infant suffered no relapse and was discharged well on August 21. Follow-up observations have shown that he has had no recurrence.

CASE 3.—J. T., a white girl aged 4½ years, was admitted to the Cincinnati General Hospital on Aug. 13, 1943 with a history of having been bitten on the left hand by a rat seven days previously. Three days after the bite she developed chills and a fever of 102 F. One day later she developed a rash, and two days later she complained of pain in the hands, wrists, ankles and knees.

The temperature at the time of admission was 103 F. and the child appeared acutely ill, irritable and in pain. There was a fine maculopapular rash covering all the extremities and the face (fig. 4). There was swelling about the left hand and wrist but no evidence of inflammation about the tooth marks. A loud systolic murmur was audible over the precordium.

A white blood cell count was 9,200 per cubic millimeter and the urinalysis, Kahn and Weil-Felix tests, tuberculin test, electrocardiogram and teleoroentgenogram of the heart were all normal.

Blood cultures were positive for Streptobacillus moniliformis on the first day after admission, and penicillin therapy was started with 4,000 units intravenously every four hours for three days and then intramuscularly for two more days. Unfortu-

TABLE 2.—*Susceptibility in Vitro of Streptobacillus Moniliformis to Action of Penicillin in Broth Mediums*

Units of Penicillin per Cc. of Broth Mediums *	Growth of Strain from		
	Case 1	Case 2	Case 3
50.00	—	—	—
25.00	—	—	—
10.00	—	—	—
5.00	—	—	—
2.50	—	—	—
1.00	—	—	—
0.50	—	—	—
0.10	—	—	—
0.05	—	+	+
0.00 (control)	++++	++++	++++

* Dextrose starch broth was used as the medium for the first two strains, and alkaline peptone broth containing 20 per cent rabbit serum was used for the third.

nately a total of only 132,000 units was available for treatment of this case. As in the previous 2 cases the blood stream was promptly sterilized, but the rash and arthritis subsided in two and five days respectively. However, four days after the penicillin was discontinued the child suffered a relapse with recurrence of fever, rash and positive blood culture (fig. 3). This episode subsided spontaneously, and the child remained apparently well except for the development of furuncles on the left arm, which were apparently unrelated to the disease. Although the child seemed well, a blood culture was found to be positive

after ten days' incubation just before her discharge from the hospital. Subsequent examinations have shown that the child has remained well and the blood cultures have continued to be negative.

The Streptobacillus moniliformis isolated in each of the 3 cases was definitely susceptible in vitro to the bacteriostatic action of penicillin. The strain isolated from the first case was completely inhibited by concentrations of 0.05 unit of sodium penicillin per cubic centimeter of broth medium. The other two strains showed partial inhibition by 0.05 unit per cubic centimeter and complete inhibition by 0.10 unit per cubic centimeter (table 2).

to infants of 10 months and 2 months respectively. It would seem more practical to give 10,000 or 15,000 units every three hours for at least seven days in any future cases of rat bite fever treated with penicillin.

There is some tendency for this disease to clear up spontaneously after a varying number of relapses, and this feature makes the evaluation of therapeutic results especially difficult in such a small series of cases. In table 3 we have summarized the salient features of all reported cases of rat bite fever in the United States in which the diagnosis was made by recovery of Streptobacillus moniliformis from the blood or joint fluid. In all there have been 17 cases up to and including 1943,

TABLE 3.—*A Summary of All Cases of Rat Bite Fever in the United States Due to Streptobacillus Moniliformis, with Diagnosis Verified by Recovery of the Organism*

Case No.	Reported by	Year	State	Sex	Age	Source	Incubation Period, Days	Rash	Arthritis	Duration	Comment
1	Blake, F. G.: J. Exper. Med. **23**: 39, 1916	1915	Mass.	♀	67	Rat bite	14	+	0	15 days (died)	Endocarditis due to Streptobacillus moniliformis
2	Tileston, W.: J. A. M. A. **66**: 995 (April 1) 1916	1915	Conn.	♀	46	Rat bite	5-8	+	0	2 months	
3	Litterer, W.: Tr. Sect. Path. & Physiol., A. M. A., 1917, p. 275	1916	Tenn.	♂	14	Rat bite	22	+	0	5 weeks	Prompt response to vaccine therapy
4	Litterer, W.: Tr. Sect. Path. & Physiol., A. M. A., 1917, p. 275	1916	Tenn.	♂	5	Rat bite	14	+	Muscle aching	6 weeks	Prompt response to vaccine therapy
5	Dick, G. F., and Tunnicliff, Ruth: J. Infect. Dis. **23**: 183, 1918	1917	Ill.	♂	10	Weasel bite	14	+	0	Over 4 months	
6	Tunnicliff, Ruth, and Mayer, Katherine: J. Infect. Dis. **23**: 555, 1918	1918	Ill.	♀	13 da.	Rat bite	9	+	0	17 days (died)	
7	Dodd, Katherine: Boston M. & S. J. **194**: 633, 1926	1923	Md.	♀	10	Rat bite	1	+	+	16 days	
8	Scharles, F. H., and Seastone, C. V.: New England J. Med. **211**: 711, 1934	1934	Mass.	♂	Adult	Rat bite	5	+	+	13 days	
9	Farrell, E.; Nordi, G. H., and Vogel, J.: Arch. Int. Med. **64**: 1 (July) 1939	1937	N. Y.	♀	40	Rat bite	14	+	+	8 weeks	Arthritis lasted about 8 months
10	Unpublished case, culled from the records of the Children's Hospital, Cincinnati	1938	Ohio	♂	3 mo.	Rat bite	2	+	+	20 days	
11	Allbritten, F. F.; Sheely, R. F., and Jeffers, W. A.: J. A. M. A. **112**: 2360 (June 15) 1940	1938	Penn.	♂	21	Rat bite	3	+	+	21 days	Arthritis lasted 53 days
12	Dawson, M. H., and Hobby, G. L.: Tr. A. Am. Physicians **54**: 329, 1939	1939	N. Y.	♂	Adult	Rat bite	"14-21"	+	+	"Weeks"	
13	Dawson, M. H., and Hobby, G. L.: Tr. A. Am. Physicians **54**: 329, 1939	1939	N. Y.	♂	Adult	Rat bite	"14-21"	+	+	"Weeks"	
14	Brown, T. M., and Nunemaker, J. C.: Bull. Johns Hopkins Hosp. **70**: 201, 1942	1939	Md.	♂	49	Rat bite	3	+	+	Over 60 days	Arthritis still present 2 years later
15	Brown, T. M., and Nunemaker, J. C.: Bull. Johns Hopkins Hosp. **70**: 201, 1942	1941	Md.	♂	49	Rat bite	3	+	0	65 days	
16	Brown, T. M., and Nunemaker, J. C.: Bull. Johns Hopkins Hosp. **70**: 201, 1942	1941	Md.	♂	21	Rat bite	2	0	+	75 days	
17	Larson, C. L.: Pub. Health Rep. **56**: 1961 1941	1941	D. C.	♂	21	Rat bite	14	+	0	Over 10 days	

COMMENT

The first 2 cases of streptobacillary rat bite fever showed a prompt and dramatic response followed by complete recovery when small doses of penicillin were administered. Definite improvement in the general condition was associated with fall in the temperature and white blood cell count, disappearance of the cutaneous rash and sterilization of the blood stream within twenty-four hours. In the third case a similarly prompt but less complete response was obtained, but a relapse occurred after discontinuance of the penicillin therapy. Because of the temporary exhaustion of our supply of penicillin, a total of only 132,000 units was administered to a child of 4½ years. In the light of later experiences in chemotherapy with penicillin, this unquestionably was an inadequate amount. In the first 2 cases a total of 302,500 and 212,500 units was administered

although there have been many more in which a diagnosis was made on a clinical basis only. Two of the 17 patients died as a result of their disease, and 3 more were left with persistent arthritis lasting fifty-three days in case 2, eight months in case 9 and over two years in case 14. Experience has been similar in Haverhill fever, a disease caused by the same organism without the bite of a rat or other animal. It is also evident that the duration of fever varied from thirteen days in case 8 to over four months in case 5. From this evidence it would seem that the usual case of streptobacillary rat bite fever treated by agents other than penicillin remains febrile either continuously or intermittently for a period of three to eight weeks.

Comparing the case records of the previous 17 cases with those of our 3 cases treated with penicillin, we believe that there is definite evidence that penicillin is

effective in the therapy of this disease in that it promptly sterilizes the blood stream, shortens the course of the disease and tends to prevent the crippling effects of persistent arthritis. This clinical impression is supported by the demonstration in vitro of the susceptibility to penicillin of the three strains of Streptobacillus moniliformis isolated. It is suggested that penicillin may be of value in the therapy of Haverhill fever, since this disease is apparently caused by the same organism.

SUMMARY

1. There are at least two forms of rat bite fever, one caused by Spirillum minus and the other by Streptobacillus moniliformis.

2. The type caused by Spirillum minus responds well to arsenical therapy, but no satisfactory chemotherapeutic agent has been available for the type produced by Streptobacillus moniliformis.

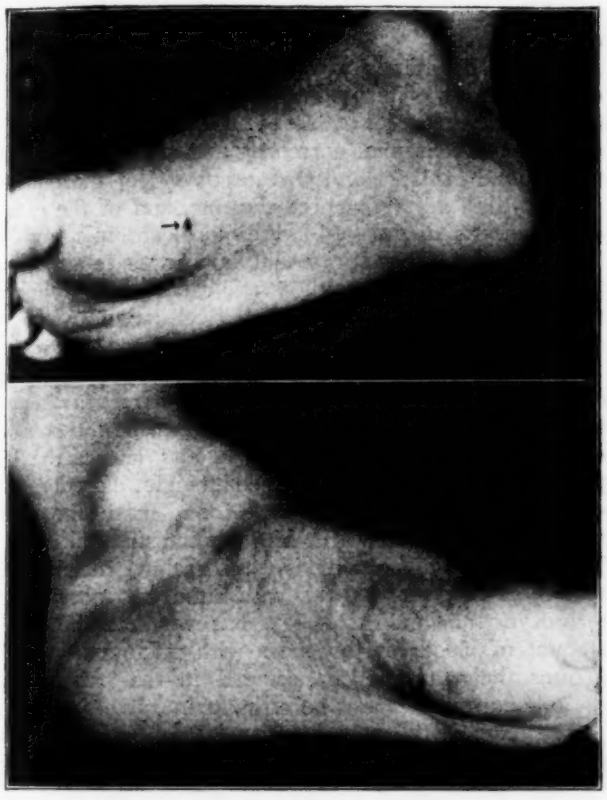

Fig. 4.—Tooth marks produced by the bite of a rat and the fine maculopapular rash of the skin of the foot, including the solar aspect (case 3).

3. A review of the literature reveals only 17 cases of rat bite fever due to Streptobacillus moniliformis in the United States in which the diagnosis was verified by recovery of the organism. Three more cases were treated for the first time with penicillin. The therapeutic response was prompt and permanent in the first 2 cases. In the third a relapse occurred after the administration of an inadequate amount of penicillin.

4. Studies in vitro indicated that penicillin has a powerful bacteriostatic effect on the three strains of Streptobacillus moniliformis recovered.

5. A comparison of the course of our cases with those previously reported gives the impression that penicillin is an effective chemotherapeutic agent which shortens decidedly the course of the disease.

6. In the future, treatment with penicillin is recommended in the therapy of rat bite and Haverhill fevers.

METABOLIC STUDIES IN PATIENTS WITH CANCER OF THE GASTROINTESTINAL TRACT

XIX. THE ANEMIA OF PATIENTS WITH GASTRIC CARCINOMA

ABRAHAM OPPENHEIM, M.D.
JULES C. ABELS, M.D.
GEORGE T. PACK, M.D.
AND
C. P. RHOADS, M.D.
NEW YORK

It is common clinical experience that patients with gastric carcinoma sooner or later develop anemia. The nature of this anemia, however, is not uniform, and variations from the macrocytic hyperchromic to the microcytic hypochromic disorders have been described. Indeed, it is not unusual to find that even in the same person the anemia may change its characteristics from month to month.

It is, of course, obvious that the existence of anemia preoperatively in these patients adds to the hazards of their operative and postoperative periods. There now is good evidence that anemia in patients submitted to prolonged surgical procedures may increase their tendency to shock states [1] and their susceptibility to infections, aggravate their usual hypoproteinemia,[2] impair wound healing and induce wound disruption.[3] Although it is possible to repair this anemic state preoperatively by whole blood transfusions, this is only a transitory measure and its frequent repetition is not always feasible. It has been found in this hospital that the administration of whole blood to these patients induces a high incidence of febrile reactions and intravascular lysis, so that in some cases after the transfusion the blood count actually has fallen.[4] Moreover, mere replacement therapy is not directed at the primary cause of the anemia and may mask a progressive disorder.

For these reasons it appeared to be desirable to study the nature and probable etiologic factors of the anemias in patients with adenocarcinoma of the stomach. The results of that investigation form the subject of the present communication.

METHODS

1. Hemoglobin concentrations were measured by the Sahli technic; [5] 13.8 Gm. per hundred cubic centimeters of blood was arbitrarily set at 100 per cent. Blood counts were made in the usual manner. Anemia was considered to exist when the hemoglobin value was less than 80 per cent or the red cell count below 4.0 million per cubic millimeter. The normal color index was taken as from 0.9 to 1.1.

From the Memorial Hospital.
Dr. Oppenheim is trainee, National Cancer Institute.

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2. Whipple, G. H.: Hemoglobin and Plasma Proteins: Their Production, Utilization and Interrelation, Am. J. M. Sc. **203**: 477-489 (April) 1942.

3. Thompson, W. D.; Ravdin, J. S., and Frank, J. L.: The Effect of Hypoproteinemia in Wound Disruption, Arch. Surg. **36**: 500-508 (March) 1938. Colp, R.: Disruption of Abdominal Wounds, Ann. Surg. **99**: 14-27 (Jan.) 1934.

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2. Marrow counts were made by the technic of Rhoads and Castle;[6] the slides were stained with Jenner-Giemsa dye.

3. Mean erythrocyte volumes were ascertained by the method of Musser and Wintrobe.[7] The normal range was considered to be from 80 to 94 cubic microns.

4. Urobilinogen was measured in the stools and urine as described by Watson.[8] Total excretions greater than 200 mg. per day indicate an increased rate of intravascular lysis.

5. The existence of gastric free hydrochloric acid was ascertained in the manner of Gompertz and Cohen;[9] 1 mg. of histamine phosphate was injected subcutaneously to stimulate acid secretion.

6. Blood loss at operation was measured by a method developed in this hospital.[10]

7. The fecal and urinary nitrogen and serum albumin and globulin were determined by a Kjeldahl procedure.[11]

8. Plasma volume was ascertained by the technic of Gregersen and Stewart.[12]

CLINICAL MATERIAL

The occurrence and type of anemia were ascertained in 122 consecutively admitted patients with gastric cancer. Blood studies were made only after each patient had been in the hospital for several days and was considered to be well hydrated. Of this group (*a*) marrow counts were made in 10 patients with macrocytic anemia, (*b*) daily total urobilinogen excretions were measured in 10 instances, (*c*) blood loss at operation was determined in 20 instances, (*d*) an attempt to induce reticulocytosis by the administration of liver extract was made in 4 and (*e*) the effect of considerable nitrogen retention on hemoglobin synthesis was studied in 4 patients.

TABLE 1.—*Relationship of Existence of Anemia to Site of Tumor*

No. of Patients	Site of Tumor	Per Cent with Anemia
59	Lower third of stomach	64.5
15	Middle third of stomach	62.5
38	Upper third of stomach	70.0
10	All of stomach	62.0

RESULTS

Of 122 patients with gastric cancer, 64 per cent had abnormally low red cell counts and concentrations of hemoglobin. This incidence agrees well with that (59 per cent) found in a previous study of 100 patients with the same neoplastic disorder.[13] It is of interest to note that the site of the gastric tumor did not significantly affect the incidence of anemia in these individuals (table 1). Likewise, no definite correlation could be made between the existence of achlorhydria and the incidence or severity of the anemic state (table 2). No attempt was made to correlate the occurrence and degree of the blood disorder with the probable duration of the neoplastic disease, for the latter factor could be estimated only very roughly by the onset of symptoms.

TABLE 2.—*The Existence of Gastric Achlorhydria in Patients with Gastric Cancer and Anemia*

Per Cent of Patients Studied	Free HCl	Average RBC Million per Cu. Mm.	Average Hemoglobin, per Cent
55	0	3.08	60.2
45	+	2.97	59.5

Of the 78 patients with anemia, the mean erythrocyte volume was macrocytic in 25, normocytic in 35 and microcytic in 18 (table 3). Of those with macrocytosis, hyperchromia, normochromia and hypochromia were found in 1, 24 and 0 respectively; of those with normocytosis all were normochromic, and of the cases of microcytic anemia 14 were normochromic and 4 hypochromic. Hence it would appear that, although the anemia of patients with gastric cancer varies widely with respect to the size of the red cells, the anemia in most instances is normochromic.

Microcytic anemia frequently may be the result of chronic blood loss or iron deficiency. Certainly there is reason to expect a gastric neoplasm to be the source of a continual and significant blood loss, and of the 18 patients with this type of hematologic disorder 10 either gave histories of or were found in the hospital to have a significant degree of gastrointestinal bleeding. This incidence of bleeding is considerably greater than that found for the patients with either normocytic or macrocytic anemia (table 4), but whether the total amount of blood lost by those with microcytosis was greater than that which occurred in the patients of the other groups cannot be estimated.

The anemia of these patients with microcytosis probably is not alone due either to a dietary deficiency of iron or to an exceptionally great loss of it. This is suggested by the fact that the daily oral administration of 3 Gm. of ferrous sulfate for from thirty-eight to forty days to 3 of the patients with this type of hemogram increased the red cell counts only from 0.1 to 0.25 million and the concentrations of hemoglobin by from 6 to 13 per cent. At the end of this time all 3 still

TABLE 3.—*The Nature of the Anemia in Patients with Gastric Cancer*

Hemoglobin Content of Erythrocytes	Patients with		
	Macrocytosis	Normocytosis	Microcytosis
Hyperchromic	1	0	0
Normochromic	24	35	14
Hypochromic	0	0	4

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13. Ariel, I.; Rekers, P. E.; Pack, G. T., and Rhoads, C. P.: Metabolic Studies in Patients with Cancer of Gastrointestinal Tract: X. Hypoproteinemia and Anemia in Patients with Gastric Cancer, Ann. Surg. **118:** 366-371 (Sept.) 1943.

had anemia, but this was then normocytic. It would appear reasonable to believe that had the anemia in these instances merely been on a basis of gastrointestinal bleeding the administration of iron should have been more effective.

Macrocytic anemia existed in 25 of the patients studied. The macrocytic anemia of patients with gastric cancer, like pernicious anemia, often has been attributed to an inadequate production of intrinsic factor. These two hematologic disorders differ, however, in many respects:

(*a*) In pernicious anemia the macrocytosis almost uniformly is associated with hyperchromia. This was not the case in patients with gastric cancer and macrocytic anemia included in the present study.

(*b*) Only 1 of the 25 patients with gastric cancer and macrocytic anemia had leukopenia or lymphocytosis; these leukocyte changes, on the other hand, are a frequent finding in cases of pernicious anemia in relapse.

TABLE 4.—*The Relationship of Gastrointestinal Bleeding to the Nature of the Anemia in Patients with Gastric Cancer*

	Patients with		
	Macrocytosis	Normocytosis	Microcytosis
Per cent with gastrointestinal bleeding	28	32	55
Per cent with no evidence of gastrointestinal bleeding	72	68	45

TABLE 5.—*The Erythroid Cell Counts in the Marrow of Patients with Gastric Cancer and Macrocytic Anemia*

Patient	Hemoglobin	Red Blood Cells	Mean Corpuscular Volume	Color Index	Erythroblasts per 100 Marrow W.B.C.	Normoblasts per 100 Marrow W.B.C.
D. W.	60	2.98	107	1.02	5.5	59
G. B.	75	3.75	98	1.02	1	7.5
J. O.	77	3.69	103	1.05	5	23
L. T.	60	3.00	100	1.00	9	30
M. S.	50	2.55	105	1.00	7	33
J. M.	46	2.54	97	0.92	10	24
R. B.	69	3.30	100	1.04	8	23
F. E.	73	3.42	100	1.05	8	21
M. D.	52	2.60	97	1.00	9	27
J. H.	53	2.94	98	0.90	6	18

(*c*) Of 10 patients with gastric carcinoma and macrocytic anemia, the marrow count failed to suggest in any instance the impaired maturation of erythroblasts characteristic of pernicious anemia in relapse (table 5).

(*d*) Finally, the intramuscular injection of adequate amounts of liver extract uniformly elicits a reticulocyte response in patients with pernicious anemia; in contrast, the daily parenteral administration of from 30 to 45 units of antianemic principle[14] for from fifteen to eighteen days to each of 4 patients with gastric cancer and macrocytic anemia failed to induce any significant reticulocytosis (table 6). Since patients with gastric carcinoma are known to have considerable hepatic disorder, it is possible that their livers no longer may be able to synthesize, utilize or store the antianemic principle.[15] When the livers of patients with various forms of hepatic disease are used as a source of antianemic principle in the treatment of pernicious anemia in relapse, no significant reticulocyte rise is induced. Studies now are under way to ascertain the effects of hog gastric mucosal preparations on this blood dyscrasia.

Although both blood disorders are associated with a high incidence of gastric mucosal atrophy, gastroscopy

TABLE 6.—*The Effects of Parenterally Administered Liver Extract on Patients with Gastric Cancer and Macrocytic Anemia*

Patient	Daily Dose, Units	Days Administered	Red Blood Cells		Hemoglobin		Height of Reticulocyte Rise, per Cent
			Before	After	Before	After	
B. D.	45	15	3.05	2.90	59	64	0.2
B. E.	45	18	2.90	2.60	59	52	0.2
L. M.	45	15	2.62	2.51	50	55	0.4
H. H.	30	15	2.44	2.47	52	56	0.4

reveals that this abnormality also occurs as frequently in patients with gastric cancer who have either normocytic or microcytic anemia. Likewise achlorhydria (an almost constant feature of pernicious anemia) occurred even less frequently in the patients with gastric cancer and macrocytosis studied than it did in those with either normocytosis or microcytosis (table 7).

There is no reason to believe that the normocytic or macrocytic anemia of patients with carcinoma of the stomach is due to an increased rate of intravascular hemolysis. The total daily excretion of urobilinogen by 10 patients with gastric malignant tumors and anemia of these types was in no instance above 166.4 mg., and the average output only 79.5 mg. per day (table 8).

It has been demonstrated that macrocytic and normocytic anemias of the normochromic type frequently occur in patients with hepatic dysfunction.[16] This observation has been confirmed here too in a group of 15 patients with cirrhosis of the liver and chronic alcoholism and in another of 4 persons with acute toxic hepatitis. A previous investigation of this series found considerable evidence of hepatic insufficiency also in patients with gastric carcinoma,[17] and among the functions particularly depressed were those of albumin and prothrombin fabrication. Whether or not these patients, because of hepatic dysfunction, likewise have an

TABLE 7.—*The Occurrence of Gastric Mucosal Atrophy and Achlorhydria in Patients with Gastric Cancer and Anemia*

	Patients with		
	Macrocytic Anemia	Normocytic Anemia	Microcytic Anemia
Number	25	35	18
Per cent with mucosal atrophy of stomach	60	66	66
Per cent with gastric achlorhydria	48	59	61

impaired ability to synthesize globin has not been determined. However, it was observed[18] that in 4 patients with gastric cancer and normocytic anemia

14. Lederle Purified Liver Extract, 15 units per cubic centimeter. This material was given to us by Lederle Laboratories, Pearl River, N. Y.

15. Wintrobe, M. M.: Relation of Disease of the Liver to Anemia: Type of Anemia, Response to Treatment and Relation of Type of Anemia to Histopathologic Changes in Liver, Spleen and Bone Marrow, Arch. Int. Med. **57:** 289-306 (Feb.) 1936.

16. Castle, W. B., and Minot, G. R.: Pathological Physiology and Clinical Description of the Anemias, London, Oxford University Press, 1936, p. 116.

17. Abels, J. C.; Rekers, P. E.; Binkley, G. E.; Pack, G. T., and Rhoads, C. P.: Metabolic Studies in Patients with Cancer of Gastrointestinal Tract: II. Hepatic Dysfunction, Ann. Int. Med. **16:** 221-240 (Feb.) 1942.

18. Rasmussen, L. H.; Abels, J. C.; Pack, G. T., and Rhoads, C. P.: Metabolic Studies in Patients with Cancer of Gastrointestinal Tract: XIV. The Effects of High Protein Diets on the Prevention of Postoperative Hypoproteinemia in Patients with Gastric Cancer, J. A. M. A. **124:** 358-360 (Feb. 5) 1944.

forced protein feedings produced a considerable nitrogen retention, and although plasma protein fabrication did take place the simultaneous production of hemoglobin probably was not in normal proportion. It has been shown by others [2] that protein administered to animals experimentally rendered hypoproteinemic and anemic

TABLE 8.—*Daily Excretion of Urobilinogen by Patients with Gastric Carcinoma*

Patient	Urinary Output, Mg.	Fecal Output, Mg.	Total Output, Mg.
F. W.	1.7	138.7	140.4
F. D.	2.7	34.2	36.9
B. S.	3.2	116.0	119.2
S. S.	1.3	101.6	102.9
M. M.	7.7	26.8	34.5
P. d. L.	0.8	36.7	37.5
F. M.	2.4	164.0	166.4
M. S.	0.4	52.6	53.0
A. A.	3.4	37.0	40.4
E. B.	6.1	60.5	66.6

is preferentially diverted for hemoglobin manufacture, and synthesis of hemoglobin and plasma proteins takes place in a ratio of about 3:1. In 3 of the 4 patients with gastric cancer, however, for every gram of plasma protein synthesized during this period an increase only of from 0.2 to 2.0 Gm. of hemoglobin occurred, and in the fourth instance the hemoglobin concentration actually fell during the period of plasma protein fabrication (table 9). This experiment lacks, of course, adequate human control data and is only of a preliminary nature, but at the moment it does suggest a disturbance of hemoglobin synthesis in patients with gastric cancer. If the anemia in most patients with gastric cancer (those not due to considerable, continual blood loss) is on this basis, then its treatment probably should be that of general hepatic insufficiency. A uniform therapeutic regimen thus far has not been generally accepted, but most investigators of hepatic disease [19] apparently believe that a diet high in protein and carbohydrate, plus supplements of a lipotropic nature and vitamin B complex, at least are necessary. The experience of this service has been that this dietary regimen often does increase the hepatic functional capacity of the patients with gastric cancer or hepatic

TABLE 9.—*The Effect of Nitrogen Retention on Plasma Protein and Hemoglobin Formation in Patients with Gastric Cancer*

Patient	Average Daily Dietary Protein Nitrogen, Gm. per Kg.	Average Daily Nitrogen Retention, Gm. per Kg.	Number of Days	Total Increase of Plasma Proteins, Gm.	Total Increase of Hemoglobin, Gm.	Increase Hemoglobin to Increase Plasma Proteins
H. P.	0.43	+0.21	22	57	−24	—
G. C.	0.42	+0.23	17	40	8	0.2
E. M.	0.39	+0.21	18	18	35	2.0
P. T.	0.40	+0.22	18	36	10	0.3

cirrhosis. It is too soon to state what the effect of these measures are on the associated anemia.

Blood loss at operation probably does not add significantly to the extent of the anemic state. In most instances this is quickly compensated for, if only temporarily, by an adjustment of plasma volume, so that the concentration of red cells or hemoglobin is only slightly altered.

Of 20 patients submitted to surgery, gastrostomies and gastroenterostomies each were performed in 3 instances; the average amounts of blood lost in their course were 140 and 130 cc. During the more extensive operative procedures of transthoracic resection of cardia tumors, subtotal and total gastrectomies, 2, 8 and 4 patients subjected to these respectively lost an average of 462.5, 232 and 194 cc. (table 10). In most instances the concentrations of hemoglobin on the day after operation were not seriously decreased from those in the preoperative periods. Nevertheless it is entirely worth while to estimate correctly the amounts of bleeding which occur during surgical manipulation. This is particularly true in elderly patients, who, because of cardiovascular insufficiency, cannot always tolerate the administration of large whole blood transfusions given to replace an overestimated amount of blood shed.

CONCLUSIONS

1. The anemia of patients with gastric cancer varies widely with respect to the size of the red cells, but in most instances it is normochromic.

TABLE 10.—*The Blood Loss During Operative Procedures in Patients with Gastric Cancer*

Type of Operation	No. of Patients	Range of Blood Loss, Cc.	Average Blood Loss, Cc.	Instances in Which Hemoglobin Concentration Decreased
Gastrostomy	3	50-305	140	0
Gastroenterostomy	3	45-250	130	1
Transthoracic resection	2	450-475	462.5	1
Subtotal resection	8	160-365	232	3
Total gastrectomy	4	150-270	194	2

2. There is reason to believe that the macrocytic and normocytic anemia of these patients is not on the same basis as that of addisonian pernicious anemia but probably is related to the associated hepatic insufficiency.

York Avenue at Sixty-Eighth Street.

19. Patek, A. J., Jr., and Post, J.: Treatment of Cirrhosis of the Liver by a Nutritious Diet and Supplements Rich in Vitamin B Complex, J. Clin. Investigation **20**: 481-505 (Sept.) 1941. Greene, C. H.: Physiologic Considerations in the Treatment of Portal Cirrhosis, J. A. M. A. **121**: 715-720 (March 6) 1943.

Health Problems on Tonga or Friendly Islands.—Very little milk is produced on the islands. There are no facilities for pasteurization. Facilities for cold storage are found only in Nukualofa, but even at that place the facilities are not nearly enough to insure adequate storage of perishable foods. Meats are inspected in some instances, but inspection is not universal and is not thorough enough to be relied on. Some fish which are normally edible are reported to become poisonous during the spawning season. In the Tonga Islands, as well as elsewhere in the Pacific, poisoning by the eating of fish in most cases is caused by fish which belong to the Tetraodontidae and which commonly are known as "puffer fish" or "balloon fish." The eggs of several species of Tetraodon are always poisonous, even when immature. The common belief that the bile and liver of this fish are poisonous is usually, but not always, true. The symptoms of Tetraodon poisoning are vertigo, headache, vomiting, diarrhea, paralysis and sudden death. Tongans suffer from a deficiency of vitamins A and D, calcium, iron and iodine. They do not like milk, eggs, fruit and green vegetables. Some fish is eaten but not a quantity large enough to supply the requirements of iodine. Foods necessary for an adequate diet could be produced in quantities sufficient to meet local needs, but habits of long standing in respect to choice of foods on the part of the natives make changes very difficult.—Simmons, James S.: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

Clinical Notes, Suggestions and New Instruments

TREATMENT OF VINCENT'S ANGINA WITH SULFATHIAZOLE

LIEUTENANT COMMANDER WILLIAM W. MANSON (MC), U.S.N.R.
AND
LIEUTENANT COMMANDER IRWIN T. CRAIG (MC), U.S.N.R.

That Vincent's organisms are frequently found in smears taken from a normal mouth is now common knowledge. They have been found in about 75 per cent of adult mouths examined, in spite of the absence of symptoms of Vincent's angina or Vincent's gingivitis, by Stafne. Their presence in smears taken for microscopic study should not be a basis for a diagnosis of Vincent's angina in the absence of clinical symptoms and signs, but when a patient is seen who has a sore throat, elevated temperature, a membrane on the throat or tonsil with a necrotic tonsillar ulcer and a smear showing numerous fusiform bacilli, and Borrelia, it can definitely be stated that the Vincent's organisms are the cause of the condition.

Arsenicals, as well as bismuth, have been shown by Ludwick,[1] Farrell and McNichols,[2] Jewesbury,[3] Farley[4] and others to be far from the specifics that they were once considered in the treatment of infections of this type. There have been a great number of cases reported of syphilitic patients who have developed Vincent's angina while on their antisyphilitic treatment. This would indicate that arsenic and bismuth are not even inhibitory where Vincent's organisms are concerned when they are employed by the intravenous and intramuscular route.

Fellows[5] employed sulfathiazole orally in conjunction with a topical application of saturated solution of neoarsphenamine in glycerin to the lesions and got good results in a series of 36 cases. Linton[6] reported 4 cases treated with sulfathiazole dissolved on the tongue, and his results were so satisfactory and the time required for establishing a clinical cure so short that it was decided to adopt his recommended treatment at this activity, where man-hours are so important. By doing so, the treatment time on the average case of Vincent's angina has been cut from ten days to seventy-two hours.

This treatment consists of a 0.5 Gm. sulfathiazole tablet dissolved on the tongue every two hours during the day and two such tablets dissolved in the same manner every four hours at night. The temperature usually returned to normal in twenty-four hours and the symptoms had almost completely disappeared by that time. In spite of the clinical improvement, the treatment was continued for a total of seventy-two hours, except in very mild cases, when it was terminated at the end of forty-eight hours. A smear taken at this time either reported no Vincent's organisms or a pronounced reduction of the Borrelia forms. Treatment, however, was discontinued at seventy-two hours regardless of the findings on throat smear because the patient was clinically if not microscopically well. Lesions were invariably cleared up in ninety-six hours after beginning treatment.

There are many cases which could be included in this report if we reported all the cases in which the laboratory found Vincent's organisms on throat smear. However, only those cases which demonstrated a tonsillar ulceration with a grayish membrane which, on smear, showed great numbers of fusiform bacilli and spiral forms are included in this report. It is felt that only these cases represent true Vincent's angina of the tonsil. Usually these lesions are unilateral. One case in our series showed bilateral ulceration of the tonsils. There was also 1 case which we listed as a recurrence though the possibility of a reinfection must be kept in mind in this case, since there was a period of two months' time without symptoms.

This series comprises 36 cases treated by the method described. No case was treated with sulfathiazole over seventy-two hours, the total dosage in these cases being 18 Gm. The milder cases received forty-eight hours of treatment for a total of 12 Gm. of sulfathiazole. Results were uniformly good in the two groups. Average sick days were 3.75 for this group, which is much shorter than that obtained with the older methods employed at this activity. These older methods included the use of neoarsphenamine locally as well as intravenously.

There were no cases of sulfonamide sensitivity in this series. Pilots and air crewmen were grounded for forty-eight hours following the discontinuance of the drug, since this measure is employed for all patients receiving any of the sulfonamide drugs.

The results have been so satisfactory in these cases that we have adopted this method as the routine treatment of all cases which demonstrated clinical Vincent's angina. The laboratory smear is employed only to confirm the diagnosis, since the finding of the Vincent's organisms alone does not constitute a diagnosis of Vincent's angina unless the clinical signs are present.

NOTE.—Since these cases were reported, 12 additional cases have been treated by the same method as described, without recurrences, for a total of 48 cases. These cases also showed extensive ulceration of the tonsil, and though the ulcer was not completely healed at the end of the seventy-two hours treatment, the patient was asymptomatic and the ulcer was seen to be cured on follow-up examination without further therapy.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Ludwick, W. E.: Evaluation of Bismuth and Arsenicals in the Treatment of Vincent's Angina, U. S. Nav. M. Bull. **42**: 584 (March) 1944.
2. Farrell, G. W., and McNichols, W. A.: Efficacy of Various Medicaments in Treatment of Vincent's Stomatitis, J. A. M. A. **108**: 630-633 (Feb. 20) 1937.
3. Jewesbury, E. C. O.: Misuse of Intravenous N. A. B. for Vincent's Infection, Brit. M. J. **2**: 360 (Sept. 18) 1943.
4. Footnote deleted on proof.
5. Fellows, A. T.: Treatment of Vincent's Angina, U. S. Nav. M. Bull. **41**: 1733 (Nov.) 1943.
6. Linton, C. S.: Treatment of Vincent's Angina of the Tonsil, J. A. M. A. **123**: 341 (Oct. 9) 1943.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

NIKETHAMIDE (See New and Nonofficial Remedies, 1944, p. 330).

The following dosage form has been accepted:

WILLIAM R. WARNER & CO., INC., NEW YORK

Ampul Solution Nikethamide 25% W/V: 2 cc. and 5 cc.

SULFADIAZINE (See New and Nonofficial Remedies, 1944, p. 178).

The following dosage form has been accepted:

WILLIAM R. WARNER & CO., INC., NEW YORK

Tablets Sulfadiazine: 0.5 Gm.

THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1944, p. 608).

The following dosage form has been accepted:

AMERICAN PHARMACEUTICAL CO., INC., NEW YORK

Tablets Thiamine Hydrochloride: 5 mg. and 10 mg.

ASCORBIC ACID (See New and Nonofficial Remedies, 1944, p. 620).

The following additional dosage form has been accepted:

GEORGE A. BREON & CO., INC., KANSAS CITY, MO.

Tablets Ascorbic Acid: 50 mg.

PREMARIN (See THE JOURNAL, Aug. 19, 1944, p. 1098).

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SATURDAY, FEBRUARY 3, 1945

SURVIVAL ON A RAFT AT SEA

Water is the primary need for survival on a raft at sea. A man who ingests ample water but not food can, as pointed out by Ivy and his associates,[1] survive twenty to thirty days, provided he is not subjected to physical strain, to which fasting renders him unduly susceptible. An adult may survive lack of food for forty or more days under favorable conditions. The longest recorded period of survival at sea without water is eleven days. Ivy [2] points out that the space and weight which can be allowed to life saving gear aboard military aircraft is naturally limited. The parachute and rubber raft are most important, and next water. This lack of space has made water packed in cans inadequate.

With the opening of the Naval Medical Research Institute in October 1942, further investigations were undertaken. The suggestion that sea water could be ingested at a rate that did not cause emesis and diarrhea —an average of 800 cc. per day—or that it could be taken as a retention enema was physiologically unsound. In practice this method was found to increase the rate of dehydration of the body and disturb the electrolyte balance. The dechlorination method devised by Goetz converted the sea water to a 3.9 per cent solution of sodium citrate. The sodium citrate is converted in the body into sodium bicarbonate. The Goetz method maintained the body water better than is possible without ingestion of water, but the alkali reserve of the blood was raised to 71 to 77 volumes per cent and the urine became too alkaline. The continued ingestion of this water would prove to be injurious. Next an attempt was made to determine whether fresh water could be extended by the addition to it of some sea water. Ivy and his associates found that not more than 1 volume of sea water should be added to 4 or 5 parts of fresh water, the maximum limit being set at 200 cc. of sea water or 6 Gm. of salt daily. Ivy showed that minimal daily water requirements under ordinary working conditions in a laboratory with enough carbohydrates to prevent ketosis (50 to 75 Gm.) ranged from 825 to 1,000 cc. in adults weighing from 55 to 75 Kg. Desalination of sea water next occupied the attention of the staff of the Navy Institute. The "Permutit" method, which was developed, involved the use of a single precipitation and the use of only one bag, into one end of which a filter was placed. This method yielded 4.5 volumes of potable water to 1 volume of chemical and equipment. A can of chemical and equipment having a volume of 700 cc. will yield 3,000 cc. of potable water. This amount of water will extend survival at least six times longer than the fresh water which is supplied in a can occupying approximately the same space. In an actual trial in which 21 men spent four days on rubber rafts at sea, this method met the requirements better than any other. The method was adopted by the various military and civilian aviation services.

In a previous communication Ivy pointed out that, although water was more important for survival than food, even a limited supply of food,[1] if properly selected, raises morale, provides appreciable energy and contributes to the conservation of the water supply. Ivy and his associates have developed a "tablet emergency ration" the three food components of which are sucrose-citric acid, sucrose-lipid-citric acid and sucrose malted milk tablets.[3]

1. Ivy, A. C.; Futcher, Palmer H.; Consolazio, W. V.; Pace, Nello, and Gerrard, Elizabeth J.: A Tablet Emergency Ration for Lifeboats and Rafts, U. S. Nav. M. Bull. **42**: 841 (April) 1944.
2. Ivy, A. C.: Contributions to Survival on a Raft at Sea, Proc. Inst. Med. Chicago **15**: 173 (Dec. 15) 1944.

THIOUREA AND EXPERIMENTAL CARCINOGENESIS IN THE THYROID

The production of carcinoma of the thyroid in rats [1] is of extraordinary interest to all students of carcinogenesis and of thyroid disease. Wilson, De Eds and Cox [2] at Stanford University discovered that 2-acetaminofluorene fed to rats produced neoplasm of many organs and tissues. Bielschowsky,[3] working in Great Britain, confirmed their observations that the implanted substance did not cause local inflammation or new growths, while feeding caused cancers of the external auditory canal, the lungs, salivary glands, liver, pancreas, bladder and breast as well as leukemias and sarcomas. All this occurred in a species with a low spontaneous occurrence of tumors and from an agent that does not cause cirrhosis or other degenerative changes. Obviously a carcinogen of extraordinary potency has been discovered by the American pathologists.

3. A Tablet Emergency Ration for Lifeboats and Rafts, editorial, J. A. M. A. **125**: 494 (June 17) 1944.
1. Bielschowsky, F.: Tumors of the Thyroid Produced by 2-Acetylaminofluorene and Allylthiourea, Brit. J. Exper. Path. **25**: 90 (June) 1944.
2. Wilson, R. H.; De Eds, F., and Cox, A. J.: Toxicity and Carcinogenic Activity of 2-Acetaminofluorene, Cancer Research **1**: 595 (Aug.) 1941.
3. Bielschowsky, F.: Distant Tumors Produced by 2-Aminofluorene and 2-Acetylaminofluorene, British J. Exper. Path. **25**: 1 (Feb.) 1944.

None of the cancerous animals in either series had tumors of the thyroid gland. Nor did cancers occur in rats fed thiourea by Bielschowsky.[1] Rats fed both thiourea and 2-acetaminofluorene did show adenomatous or anaplastic invasive epithelial tumors. Thiourea alone produced, as it does in man and other animals, an intensely hyperplastic thyroid gland. Thus a chemical that causes hyperplasia limited to a single organ prepared that organ for carcinogenesis by a chemical which normally is effective only on other tissues. As thiouracil is being given to men, and as acetaminofluorene was under consideration as an insecticide, these results have not only theoretical but practical significance.

Occupational cancers of man led the Japanese to the discovery of experimental chemical carcinogenesis. The frequency of histologic neoplasms in hyperplastic cirrhotic livers, in hyperplastic prostates and in nodular goiters is recognized by most pathologists. The importance of hormonal chemical agents in carcinogenesis, stressed first by Leo Loeb, has been widely confirmed in human experience and animal experiment. Human cancers, and those of most mammals, have not been found to be transmitted by infection or by filtrable agents. The truly startling effects of acetaminofluorene on various tissues of the rat, and the necessity for hyperplasia as a concurrent factor in thyroid carcinogenesis, reemphasize the importance of chemical carcinogens and of hyperplasia in predisposition to cancer in man.

If viruses assume any role in the thyroid cancers evoked by these two chemicals, it must be a role different from that of the filtrable agents from leukemic or tumor cells of birds or rabbits, since these regularly reproduce specific cellular reactions if injected into other members of the same species. It is just as improbable that chemical carcinogens act by the activation of local latent viruses as that chloroform or phosphorus damages the liver, or mercury the renal tubules, by the activation of latent viruses in these tissues. Herpes virus is apparently latent in nearly all human beings and is activated by many factors, some of them trivial disturbances of bodily functions. In toxoplasma encephalitis of the newborn and in congenital syphilis, latent infectious agents manifest themselves in the rapidly growing fetal tissues. The possibility cannot be excluded that some types of hepatitis, encephalitis, nephritis and even of cancer may be due to activation of latent viruses. But when a carcinogen evokes cancers in nearly all the tissues of nearly all the members of a species in which spontaneous tumors of most tissues are extremely rare, it must be conceded that viruses do not assume a role in the phenomena or that the latent cancer viruses are as all pervasive and therefore of as little specific significance as salt and water.

The thyroid carcinogenesis reported by Bielschowsky raises a practical question as to the possible hazard of using thiouracil in toxic diffuse goiter except as preliminary to resection of the gland. In old and even in middle aged patients some adenomas are usually found. Microscopic studies are said to reveal carcinomas in 3 to 8 per cent of grossly adenomatous goiters, and even in hyperplastic thyroids removed for toxic diffuse goiter occasional cancers have been found arising in minute adenomas.[4] Since thiourea and acetaminofluorene together evoke rapidly growing tumors, which neither alone produces, may not thiouracil, together with the dyscrasia which causes adenomas and "carcinoma in situ" in so many thyroids, lead to clinical cancer when prolonged action is maintained in older patients? This is a problem which all thyroid clinics using thiouracil will undoubtedly keep under the closest surveillance.

BIOLOGIC VALUE OF SOY PROTEIN

This country, with its vast food producing capacity and food stores, has developed average food habits at a level not even approached elsewhere. In the United States the soybean has not been the staple, main source of nutriment that it is to large portions of the world's inhabitants. Soybean flour has been increasingly included in breads and pastries; the small increase in protein, the "richer" color and the nutty flavor imparted by modest admixture of this material are some of the reasons for the growing diversion of soybeans to the production of low fat soyflour. The possibility, emphasized by the war, that the large quantities of soybeans raised in the United States might provide human food which could be substituted for more expensive or less readily available nutrients ordinarily consumed has received attention in the present national emergency.

Of particular interest in this connection is the suitability of the protein of soybeans for human consumption. The dry seeds contain about 34 per cent of protein; as some 216,000,000 bushels was produced in 1944, this legume represents a tremendous reserve of food protein, provided it is physiologically available in the body. Although the long history of the use of soybeans as human food would seem to argue a priori against any considerable detrimental effect, convincing evidence of its value in this respect has been lacking. In a recent experimental study [1] comparison of the net retention of nitrogen by adult human subjects when soybeans provided the protein with the same values when whole egg was the main protein of the experimental diet was measured. The assumption was made that the protein of the whole egg is completely digested, absorbed and utilized, in which case the fecal and urinary nitrogen when egg was consumed would represent the evidence of irreducible protein metabolism.

4. Goetsch, Emil: A New Concept Regarding the Origin of So-Called Primary Carcinoma of the Hyperplastic Thyroid, Ann. Surg. **118**: 843 (Nov.) 1943.

1. Cahill, W. M.; Schroeder, L. J., and Smith, A. H.: J. Nutrition **28**: 209 (Sept.) 1944.

Soybean protein in three forms was studied: as whole cooked, field grown beans, as commercial low fat soyflour and as a prepared soybean milk. The true digestibility of the protein in the three products was 90.5, 94.0 and 89.6 per cent respectively when compared to whole egg protein. These values are somewhat lower than those for food proteins of animal origin but superior to those usually observed with other legume protein. With respect to the biologic value of soybean protein, the values were 94.5, 91.7 and 95.3 per cent respectively, indicating that, tested under the conditions cited, soybeans in the forms employed can be considered an excellent source of protein in adult human nutrition.

In view of the current enormous production of soybeans, our national nutrition, as far as protein is concerned, is amply safeguarded against an extensive emergency. Likewise, in the occasional instances in which usual food protein is not well tolerated, the soybean offers additional possibility of dietotherapeutic adjustment with respect to protein nutrition.

Current Comment

GRAMICIDIN S

The latest result of the search for antibacterial substances in fungi and other microbes appears to be the isolation by Russian investigators [1] of a crystalline bactericidal polypeptide from the liquid culture of an aerobic sporulating soil bacillus of the Bacillus brevis type described by Stokes and Woodward.[2] This strain was one of several hundred strains of sporulating bacilli from Russian soil studied with respect to antibacterial action but with otherwise negative results. The alcoholic extract of the acid precipitate of liquid cultures of the bacillus yields the active principle in easily obtained thin, colorless crystalline needles, alcoholic solution of which diluted with water has bacteriostatic and bactericidal effects on staphylococci, streptococci, pneumococci and some other gram positive bacteria as well as on a number of gram negative bacteria, including Proteus vulgaris and Escherichia coli. This antibacterial substance has been named Soviet gramicidin or gramicidin S. Chemically it differs from the gramicidin of Dubos and from tyrocidine hydrochloride; [3] it is a stable substance; its activity is not destroyed by autoclaving. Experimentally it was found to protect guinea pigs and rats against infection with the gas bacillus. Sergiev [4] reports on its clinical use by local application in 1,500 cases in ten Soviet hospitals. Solutions in water or in 70 per cent alcohol, containing in each cubic centimeter 400 mg. of gramicidin, were used; also ointment of a 4 per cent alcoholic solution of the dry substance diluted fifty times with castor oil. Favorable results were obtained in suppurations of soft tissues and in skin grafting, osteomyelitis, empyema, peritonitis and skin infections. In the latter the best results followed the application of dilute alcoholic solutions. Conclusions are not drawn with regard to the prophylactic value of gramicidin S, but all wounds treated prophylactically with it "healed by first intention." Toxic effects did not result from the external use or the introduction into the pleural or peritoneal cavities of the watery solution of gramicidin S. Alleviation of pain is mentioned as a characteristic feature of its use. The outcome of further observations on the value of gramicidin S will be of great interest.

1. Gause, C. F., and Brazhnikova, M. G.: Gramicidin S: Origin and Mode of Action, Lancet **2**: 715 (Dec. 2) 1944.
2. Stokes, J. L., and Woodward, C. R.: The Isolation from Soil of Spore Forming Bacteria Which Produce Bactericidal Substances, J. Bact. **43**: 253 (Feb.) 1942.
3. Belozensky, A. N., and Passhina, T. S.: Chemistry of Gramicidin S, Lancet **2**: 716 (Dec. 2) 1944.
4. Sergiev, P. G.: Clinical Use of Gramicidin S, Lancet **2**: 717 (Dec. 2) 1944.

EPILEPSY—ACCURATE INFORMATION FOR THE PUBLIC

The Public Affairs Committee, with the aid of a number of leaders in the field of epilepsy, has made available a useful, realistic consideration of the disease for the lay reader.[1] After description of a typical case the report discusses what epilepsy is and how it got its bad name. The pamphlet suggests consideration to changing the name of the disease because of its bad connotation but rejects the suggestion. Causes and diagnostic methods are next discussed, including a simple, clear explanation of the electroencephalograph. Modern methods of treatment are outlined. The expensiveness of quackery is emphasized. Useful books for epileptic patients are listed. Sensible advice about sending children with seizures to school and about marriage and parenthood are given. An encouraging survey of industrial opportunities for the epileptic is outlined. All in all, this is a fine, brief and inexpensive pamphlet which should be of great use to patients. Physicians dealing with the epileptic and their families might find it decidedly advantageous to give a copy of this pamphlet as a planned part of the therapeutic regimen.

TARTARIC ACID

A recent note [1] on foreign trade lists the items of largest importation from Italy since the present war began. Among such items as essential oils, red squill, onion seeds and wine is 112 tons of argol. This substance is crude potassium acid tartrate; it crystallizes as a thick crust on the walls of wine vats and to date has been the main source of tartaric acid. In view of the wide use of this organic acid in the food industry and in medicine, it is of more than passing interest that such an important substance should depend on a source which is so readily curtailed by war in restricted localities. As happened in connection with citric acid after the last war, efforts are now being made to adapt new biochemical principles to the synthesis of organic acids which will be satisfactory substitutes for tartaric acid in the various ways in which it has entered into the technology of food and pharmaceuticals.

1. Yahraes, Herbert: Epilepsy—The Ghost Is Out of the Closet, New York, Public Affairs Committee, Inc., 1944, 10 cents.
1. Time **44**: 80 (Nov. 13) 1944.

MEDICINE AND THE WAR

ARMY

SKIN DIPHTHERIA IN SOLDIERS

Major Gen. Norman T. Kirk, Surgeon General of the Army, recently reported that minor epidemics of skin diphtheria which have broken out among American soldiers in the Pacific areas have been brought under early control. While these epidemics have not been of serious consequence, the problem of skin diphtheria is one of serious potential significance.

Lieut. Col. F. R. Dieuaide, chief of the tropical disease treatment branch of the Surgeon General's Office, who recently returned from a three months visit in three Pacific theaters, described a small epidemic of skin diphtheria in the New Hebrides. It is thought that the epidemic arose from carriers. From this source in the skin of 1 person organisms are readily transferred to skin lesions in other persons or to the throats of susceptible soldiers. Colonel Dieuaide said that this disease has been found in this war in North Africa, in India and in the Pacific. In general it is so rare that it is unknown to the public at large, including many doctors. Inability to take proper hygienic care of the skin and superficial wounds and living in close quarters give rise to its spread. The great importance of skin diphtheria, Colonel Dieuaide said, lies in the danger that it may cause epidemics of ordinary diphtheria in susceptible soldiers who would suffer the usual severe illness. A small number of such cases and a few deaths have occurred.

MILITARY TRAINING FOR WACS

The War Department announced recently that all military training for the Women's Army Corps will be consolidated at the First WAC Training Center, at Fort Des Moines, Iowa, by April 1. The Third WAC Training Center, at Fort Oglethorpe, Georgia, will be discontinued by that date. Only WAC training activities at Fort Oglethorpe are affected by this consolidation.

Consolidation of military training facilities is in line with the Army's WAC recruiting program for 1945, which will stress the enlistment of women possessing specialized skills rather than large numbers, together with those qualified for training and service as medical and surgical technicians in army hospitals. The efficient and economical utilization of training personnel and facilities will require only the one WAC training center at Fort Des Moines for basic and specialized military training in light of reduced enlistment quotas in 1945. Medical and surgical technicians will receive specialized training in army medical department schools and hospitals after completion of basic military training.

ARMY AWARDS AND COMMENDATIONS

Captain Alan R. Bleich

The Soldier's Medal was recently awarded to Capt. Alan R. Bleich, formerly of Brooklyn, for saving the life of a pilot caught beneath a burning plane. Disregarding his own safety and the imminent danger of the burning plane exploding, Captain Bleich crawled beneath the plane as it was hoisted to cut loose Capt. Jake L. Wilk, Houston, Texas, pilot. Captain Bleich was medical officer of the day (September 28) and was seated in his jeep while the P-38s were taking off on a bombing mission against targets in Germany. As Captain Wilk took off, it was evident that he was experiencing engine trouble and was going to have to make a forced landing. Captain Bleich immediately started for the end of the runway and found that Captain Wilk's plane had overturned and he was pinned under the canopy. Grabbing a shovel, Captain Bleich dug the dirt away from the canopy so that the pilot could get some air. At the same time he directed the crash crew to pass a chain under the nose of the plane so that it could be lifted and the pilot taken out. Another fire then broke out around the left engine. Without hesitation, Captain Bleich got under the plane and cut the pilot loose from his safety straps. While under the plane there was imminent danger of the chain slipping, crushing both of them. Dr. Bleich is a licentiate of the Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow, 1940. He entered the service Oct. 29, 1942.

Major Sidney Schnur

Major Sidney Schnur, formerly of Houston, Texas, has been awarded the Bronze Star Medal. According to the citation, "Major Schnur showed great initiative, ingenuity and ability in maintaining the health of the command. By successfully raising the sanitation level of the Air Force field installations to an unusual degree, by initiating and following through a malaria control program which has actually controlled the disease, by persistent efforts and novel procedures in the control of venereal diseases, by improving the quality of food served in field messes through introduction of new methods of procurement and distribution, by devising and supplying escape first aid kits to combat personnel and by his continuous research in various fields of aviation medicine Major Schnur lowered the noneffective rate from disease to a bare minimum. Major Schnur's devotion to duty and his successful and tireless efforts in the fields of health, hygiene and sanitation reflects great credit on the armed forces of the United States." Dr. Schnur graduated from New York University College of Medicine, New York, in 1935 and entered the service in October 1940.

Colonel Albert R. Dreisbach

The Legion of Merit was recently awarded to Col. Albert R. Dreisbach, formerly of Washington, D. C., for "services from February 1942 to October 1944 as assistant director and director of the division of health and sanitation in the Office of the Coordinator of Inter-American Affairs. He contributed greatly to the joint war effort of the American republics through his effective direction of the cooperative health and sanitary program, designed to support military operations, production of strategic materials and morale in the tropical areas of the American republics. His initiative, imagination and loyalty contributed to the application of health measures in eighteen of the Central and South American republics, safeguarding the interests of both the United States and these countries." Dr. Dreisbach graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1931 and entered the service June 17, 1931.

Colonel William H. Huntington

Commander, Order of the Crown of Italy, has been conferred on Col. William H. Huntington, formerly of Portland, Ore., and now commanding officer of a station hospital with the Peninsular Base Section, the first American supply base established on the European mainland. There was still fighting in Naples when the section arrived, and it was also confronted with a serious epidemic of typhus. Quantities of DDT powder were rushed in, delousing stations set up throughout the populated districts, and by virtue of fast and vigorous work, what might have been a disastrous epidemic was averted. Dr. Huntington graduated from George Washington University School of Medicine, Washington, D. C., in 1910 and entered the service Aug. 22, 1941.

Captain Henry Clay Robertson Jr.

Capt. Henry Clay Robertson Jr., formerly of Charleston, S. C., was recently awarded the Bronze Star Medal. The award was made for "meritorious achievements in connection with extensive military operations" against the enemy. Dr. Robertson graduated from the Medical College of the State of South Carolina, Charleston, in 1935 and entered the service July 23, 1942.

MISCELLANEOUS

AMERICAN COLLEGE OF SURGEONS DEFERS WAR SESSIONS

The American College of Surgeons has deferred for the time being its 1945 series of War Sessions, four of which were to have been held in February, according to an announcement by Dr. Irvin Abell, chairman of the Board of Regents. Dr. Abell states that plans had been completed for the February meetings because earlier indications were that sessions of a strictly educational nature, limited to relatively small local areas, would be sanctioned by the War Committee on Conventions, but it now develops that the transportation crisis is so acute that even this type of meeting should be omitted in order to help the war effort, and the College is glad to cooperate with the agencies responsible for the movement of military personnel and supplies.

The American College of Surgeons has voluntarily omitted its annual clinical congress ever since the United States entered the war, in order to aid the war effort by minimizing the demands on transportation facilities. The War Sessions were devised as a wartime expedient to preserve the educational values as far as possible, with greatly lessened demands on hotel and travel services.

The February meetings were to have been held in St. Louis on the 2d, in Louisville on the 5th, in Milwaukee on the 7th and in Cleveland on the 27th.

SURPLUS FIRST AID DRESSINGS

The Office of Surplus Property of the Treasury Procurement Division has announced that it is imposing no restrictions on the use of the 28 million Carlisle first aid dressings recently placed on sale by its medical and surgical division. This action is based on the following letter, which the Treasury received from the Food and Drug Administration:

> We have reviewed the labeling and have observed the dressings of the "small first aid dressing U. S. Army Carlisle Model sterilized" and the labeling of the "large size first aid dressing U. S. Army Carlisle Model sterilized" which you submitted to us today.
>
> So far as the requirements of the Federal Food, Drug and Cosmetic Act are concerned, assuming that the lot of merchandise involved does in fact consist of sterile first aid dressing, there is no objection to the sale of this material for use by the medical profession or by the lay public. We might add, however, that we doubt whether there will be any considerable demand for dressings of this size by the lay public.

While the Treasury Department cannot warrant that each of the dressings is sterile, the announcement by the Office of Surplus Property was promoted by the fact that advertisements of this merchandise had previously stated that the dressings were not to be used for medical purposes.

The Treasury Department has extended until 2 p. m. Central War Time, February 17, the time during which bids will be received on this merchandise at the Procurement Division Regional Office, Cincinnati, and persons who have already bid may, if they so desire, revise their bids in light of the new ruling.

AMERICAN COMMITTEE FOR MEDICAL AID TO ITALY

In reference to the notice in THE JOURNAL of Dec. 23, 1944, page 1097, concerning the organization of Medical Aid for Italy, the president of the committee, Dr. Arturo Castiglioni, professor at Yale University, wishes to express his thanks to the many doctors who sent him instruments, medicine and other gifts. The need in Italy is extreme and the mortality of children has assumed the rate of 47 per cent. The rate of tuberculosis has tripled in recent months. There is also an urgent request from Italian doctors for American medical reviews and medical books, which have not been brought into the country since 1939. All gifts will be conveyed to Italy through the American Relief for Italy, Incorporated, or will be used for the purchase of medicine and instruments. All donations will be most gratefully accepted and should be addressed to the American Committee for Medical Aid to Italy, 225 Lafayette Street, New York 12, N. Y.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Gardiner General Hospital, Chicago: Diseases of the Intestinal Tract: Medical and Surgical Diagnosis and Care, Drs. Warren H. Cole and Walter L. Palmer, February 14; Plexus and Peripheral Nerve Injuries, Dr. Adrien H. Verbrugghen, February 28.

Station Hospital, Fort Sheridan, Ill.: Dermatologic Diseases, Drs. James H. Mitchell and Francis E. Senear, February 15; Burns and Plastic Surgery, Drs. Wayne B. Slaughter and Volney B. Hyslop, February 28.

Mayo General Hospital, Galesburg, Ill.: Malignancies in the Army Age Group: Medical X-Ray and Surgical Diagnosis and Treatment, Drs. Danely P. Slaughter and George J. Rukstinat, February 14; Endocrinology, Dr. Willard O. Thompson, February 28.

Station Hospital, Camp Ellis, Lewistown, Ill.: Wound Healing and Tendon Surgery, Drs. Hilger P. Jenkins and Alfred Rasmussen, February 14; Mental Hygiene and the Prevention of Neuroses in War, Capt. Charles O. Sturdevant, February 28.

Regional Hospital, Chanute Field, Rantoul, Ill.: Blood Dyscrasias; Malaria; Filariasis, Drs. Raphael Isaacs and Henry Jacobs, February 14; Diseases of the Kidneys: Urogenital Tract, Drs. Laurence E. Hines and Norris J. Heckel, February 28.

Station Hospital, Harding Field, Baton Rouge, La.: Psychosomatic Medicine, Dr. Theodore Watters, February 8; Vascular Diseases, Dr. Howard Mahorner, February 8; Fractures of the Ankle, Lieut. Col. Samuel Terhune, February 8; Amputations, Dr. Rawley Penick, February 8.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, January 27, page 226)

GEORGIA

Grady Memorial Hospital, Atlanta. Capacity, 720; admissions, 14,067. Mr. Frank Wilson, Superintendent (residents—medicine, surgery, obstetrics-gynecology).

ILLINOIS

Holy Cross Hospital, Chicago. Capacity, 161; admissions, 4,199. Sister M. Dorothea, R.N., Superintendent (3 interns, July 1).

Illinois Masonic Hospital, Chicago. Capacity, 186; admissions, 5,322. Mr. William H. Tenney, Superintendent (2 interns, July 1).

MASSACHUSETTS

St. John's Hospital, Lowell. Capacity, 200; admissions, 4,407. Sister Angelica, R.N., Administrator (3 interns, July 1).

Belmont Hospital, Worcester. Capacity, 250; admissions, 1,061. Dr. Huston K. Spandler, Superintendent (resident—communicable diseases, July 1).

MICHIGAN

Grace Hospital, Detroit. Capacity, 549; admissions, 17,792. Dr. John H. Law, Director (residents—surgery, urology).

St. Mary's Hospital, Grand Rapids. Capacity, 315; admissions, 7,539. Sister Mary Grace, Superintendent (2 interns).

MISSOURI

Menorah Hospital, Kansas City. Capacity, 145; admissions, 3,707. Dr. E. Kirsch, Administrator (interns).

Jewish Hospital, St. Louis. Capacity, 303; admissions, 6,704. Miss Florence King, Administrator (residents—surgery, obstetrics-gynecology).

NEW YORK

St. John's Hospital, Brooklyn. Capacity, 250; admissions, 3,959. Mr. E. Reid Caddy, Director (interns, July; April 1946).

St. John's Riverside Hospital, Yonkers. Capacity, 220; admissions, 4,429. Mr. S. Chester Fazio, Superintendent (2 interns).

PENNSYLVANIA

St. John's General Hospital, Pittsburgh. Capacity, 250; admissions, 5,125. Sister M. Baptista, Superintendent (3 interns, July 1).

WASHINGTON

St. Luke's Hospital, Spokane. Capacity, 335; admissions, 5,800. Mr. Gordon W. Gilbert, Administrator (2 interns, July 1).

ORGANIZATION SECTION

ANNUAL CONFERENCE OF SECRETARIES AND EDITORS OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

SATURDAY MORNING SESSION, NOVEMBER 18

DR. D. L. CANNON, Montgomery, Ala., Presiding

(Concluded from page 230)

Radio Broadcasting by the Medical Profession

DR. A. S. BRUNK, Detroit: When I speak of "radio advertising by the medical profession" I mean advertising in its commercial sense—by the purchase of time over the air to bring a message about medicine and a "plug" for the medical profession and its philosophy. The Michigan story begins with the levy of a special $10 per capita assessment by the Michigan State Medical Society House of Delegates at its September 1943 session. The assessment was effective for the calendar year 1944. This assessment was earmarked for public education. The activity included a "School of Information" for county society officers and key men, the purchase of thousands of pamphlets, a contribution to the Michigan Health Council (which is an agency that informs the public through a general educational program what the medical society and the hospital association and the Michigan Hospital and Michigan Medical Service are doing to meet the health needs of all the people in our state). But the greatest activity from the assessment was the program of radio advertising sponsored by the state medical society at a cost of $10,000.70. A special Committee on Radio, composed of three members, was appointed.

The chairman, who practices medicine in Detroit, had for years obtained gratifying results from the radio advertising of a flourishing commercial business which he had inherited. He had the experience and the practical touch. He recommended the placing of the program in the hands of an advertising agency equipped and interested in doing the job. Such an agency, which had served the dental profession of the state in its fight against advertisers, was enlisted. Soon twelve Michigan stations were lined up for two five minute broadcasts each per week for thirteen weeks. The radio stations were chosen geographically so that every section of the state was covered.

The twenty-six five minute presentations were dramatized sequences of an educational nature. The theme of the skits depicted the benefits to the public of the present and proposed medical availabilities as contrasted with the federal bureaucratic compulsory forms of medical practice. Subject matter of some of the skits included anesthetics, appendicitis, blood plasma, bubonic plague, cataracts, insulin, diphtheria, bone fracture, malaria, penicillin, rabies, rickets, spinal meningitis, plastic surgery, typhoid and subdural hematoma. The advertising agency developed, produced and transcribed the dramatized episodes under the supervision of the Michigan State Medical Society's Special Committee on Radio. Most of the ideas depicting medical incidents in the daily lives of the people originated in the minds of the members of the committee or of other medical men interested in the program. Professional radio actors of high histrionic ability were used. Each transcription had the following introduction: "Presenting a dramatized epic in the history of American Medicine and its application by American Physicians." The sequence was followed by the following plug: "American Medicine, the private practice of which represents the cumulative knowledge of decades, the heritage of centuries, the sacrifices and discoveries of countless individuals, has made the United States the healthiest country in the world. Spinal meningitis, diphtheria, smallpox, typhoid fever and other fatal diseases, scourges of yesteryear, are today either preventable or curable, a credit to the tireless efforts of the American medical profession. Thirty-seven states now have voluntary prepayment medical or hospital plans developed by the medical profession and the hospitals. No theoretical plan, government controlled and operated, and paid for by you, should replace the tried and proved system of private practice now in use."

The program began over the twelve Michigan stations on August 1 and ended over Detroit's WXYZ on November 15. The results will be of interest to you. Toward the end of the series a spot or chain break (of about twenty-four words) was made after each presentation over all the twelve stations. This announcement offered something free to all listeners in order to ascertain listener interest. That which was offered was a copy of a recent booklet published by the Michigan Health Council containing the highlights of the Michigan Survey of Public Opinion concerning Medicine, which poll had been made by the Health Council at a cost of $9,500. To date but a small number of requests have been received for these booklets, which is understandable, as there have been only two announcements over outstate stations and one from Detroit. However, our agency advises us that recent surveys of the various stations over which our program is broadcast show a combined potential listening audience of 1,250,000 people, or approximately 20 per cent of Michigan's population.

We feel that Michigan's experiment in radio advertising of the medical profession has been fruitful. Some of the people now know there are two sides to the question of distribution of medical care and, further, that the solution does not lie in the visionary panaceas offered by self seekers or dreamers who know little or nothing about medical practice and its intricate ramifications but in a thoughtful, painstaking evolution being worked out by the medical profession of the United States. Many now realize that private practice, aided by supplementary features (such as Michigan Medical Service with its 700,000 subscribers), are to be preferred—for their own good—than compulsion and further taxes out of Washington. I myself feel that the experiment has proved its worth and the Michigan State Medical Society will continue its radio advertising in the coming year.

Radio is a powerful vehicle, recognized by business, industry and even by politicians. Its value must not be overlooked or underestimated by the medical profession. Its use on a commercial basis—call it "propaganda" if you will—must be grasped by medical organizations now. The ear of the people must be reached today, not after the politicians have sold them a bill of cheap goods—via the radio!

If requested, assistance will be freely given to other state medical societies who may be interested in developing a similar program of radio advertising.

DISCUSSION

DR. OLIN WEST, Chicago: The American Medical Association itself has long maintained a nationwide broadcasting program and within the last several months has provided transcriptions for the use of medical societies and some for the use of some other groups. Those transcriptions are being rather freely used. Some of the medical societies seem to think that they have been extremely helpful. As far as I know, none of the other state programs have put on a paid broadcast. It is a question that seems to me to be of great interest, as to whether it is not a duty of the radio and the press to help in the dissemination of helpful, authoritative information about health matters. I do not know whether the time will ever come when the organized medical profession over the nation will wish to engage in a program similar to this, but I do agree with Dr. Brunk that the radio is a powerful instrument and that, properly used by the medical profession, it can have a tremendous effect in promoting the interest of medicine and thereby promoting the interest of the public.

DR. W. F. DONALDSON, Pittsburgh: I wish to express my personal gratitude to the Michigan Medical Association for its enterprise and enthusiasm and for the extent to which its

entire membership has contributed to this effort. Pennsylvania has for a number of years carried on as far as possible, not in the name of the state medical society but of many component medical societies, these instructional health programs. I appreciate just exactly how difficult it is to keep up the interest of state medical societies in providing the programs for the numerous broadcasting stations that are scattered throughout a state like Pennsylvania. Recently the American Medical Association has come to our rescue and we are using these transcriptions, or platters. It is astonishing the way these small broadcasting stations in towns of anywhere from 20,000 to 50,000 people like to receive these platters. We have a constant demand for them. I only hope that other state medical associations are using them as enthusiastically as we are in Pennsylvania. I want to express again my personal interest in this movement in Michigan. I do not know how soon I might be able to persuade Pennsylvania doctors to subscribe to the extent of $10 apiece for such an experiment, but I am sure that it has great possibilities, and what we need above all things is persistence.

Dr. W. T. Brockman, Greenville, S. C.: I believe that, as somebody said, medicine is gradually being maneuvered into something that is entirely different from our tradition. I think that in South Carolina we are hungry for some kind of a change. We realize that we must make a change. Recently our live secretary has formulated and brought before our council a ten point program to acquaint the public better with what we are trying to do. In a modest way we started out with a few radio programs. I certainly am pleased to hear the Michigan doctor tell us about how well they have done this. It is going to stimulate me as president-elect of my society to push this movement. I think we have leaned backward in our modesty for a long time and that, regardless of how much we dislike to become bold and get out in front, we are going to have to do it in a dignified, modern way, as has been suggested here by our Michigan friends.

Mr. T. A. Hendricks, Indianapolis: May I ask one question? What is the reaction to sponsored programs, that is, to programs sponsored by a commercial company? For a number of months we in Indiana have put on programs on a sustaining basis, that is, we do not get a good hour on the radio. We do not pay anything for our time. We have a company that sponsors our program. We produce it, we write the script. It is merely sponsored by a commercial company. We can get a good hour on the radio. What is the reaction to such an arrangement?

Dr. Stanley B. Weld, Hartford, Conn.: You have heard Dr. West and Dr. Donaldson refer to radio programs not paid for, and I am sure that is the universal or pretty nearly the universal custom throughout the state. I wanted to ask Dr. Brunk just why the Michigan State Society felt it necessary to have a paid program.

Dr. A. S. Brunk, Detroit: First, I want to thank those who have discussed the paper and shown an interest. I like the expression that the doctor from South Carolina used when he said that medicine is being maneuvered into a change. That is true and, as I see it, it is time that the medical profession gets immediately on the job and does something to try to guide that change. I am afraid that if it is not done promptly it may be too late. Concerning the question asked by Mr. Hendricks of Indiana as to what the difference is between a paid radio program and one sponsored by some commercial organization, I do not think there is any difference. Your commercial organization pays for the time as I understand it and it just saves the medical profession that much expense. They do get better hours because they are being paid for. We, of course, have the scientific programs which are donated by the radio station in Michigan and we don't get good times. The other question that was asked was why we thought it necessary to pay for radio broadcasting. Well, it is for the same reason that I have just stated, that is, you get better time and you can control the entire program. You can put on what you will. You cannot put on a commercial program over the radio without paying for it. This is a commercial program and not a scientific program. The radio stations will not donate time for commercial programs.

Washington Letter

(From a Special Correspondent)

Jan. 29, 1945.

General Hawley Appeals for Nurse Enlistments

A personal appeal to every nurse in the United States who is not in uniform was made by Major Gen. Paul R. Hawley, chief surgeon, European theater of operations, in a broadcast from Washington, to encourage enlistment in the Army Nurse Corps. Nurses in the European theater, he said, are "getting tired. . . . They are working rarely less than twelve hours a day and frequently as long as sixteen. They are making a record that is the most glorious page in the history of nursing. They are not complaining, but they cannot stand this strain indefinitely." General Hawley said that his appeal was "in behalf of thousands of wounded American boys—and, I am afraid, thousands more who will be wounded after this war is ended. These are the ones who suffer from the critical shortage of nurses. And this shortage is getting greater each day."

Improvement of Child Adoption Laws Urged

Review and improvement of laws relating to child adoption is urged by Katharine F. Lenroot, chief of the Children's Bureau, United States Department of Labor, in regard to the bureau's recommendations as to essentials of adoption laws and procedures. Not more than a fourth of the states have adoption laws that approximate the standards believed necessary by the bureau for adequate protection, she said. The following principles were recommended in adoptions to safeguard interests of all three parties concerned, the child, the natural parents and the adopting parents: 1. Adoption proceedings should be before a court dealing in children's cases. 2. The court should have the benefit of state welfare department study and recommendations in every proposed adoption. 3. Consent should be obtained from the natural parent. 4. Court hearings should be closed to the public. 5. A period of residence in the adoption home should be required before issuance of the final adoption decree. 6. Provision should be made for removal of children from homes found to be unsuitable. 7. Safeguards should be provided in related laws, such as relinquishment of parental rights, regulation of child placing services, determination of guardianship and custody of child.

Women Needed for Special Hospital Duties, Says Mrs. Roosevelt

Women are needed for other duties in military hospitals besides nursing, Mrs. Roosevelt said in her column My Day, which is released from Washington. They are required to become laboratory technicians, nurse's aides and in other ways to supplement the work of the registered nurses. "If a girl feels that she wants to work in hospitals but still does not want to take a nurse's training," Mrs. Roosevelt said, "there are many possibilities open in the armed services."

Public Health Nurses Paid High Tribute

High tribute to the work of public health nurses was paid by Dr. J. W. Bird, president of the Medical and Chirurgical Faculty of Maryland and secretary of the Montgomery County Medical Society. "They are of the greatest assistance to us these busy days, and long before the present emergency they were doing the same magnificent job, modestly and without acclaim," he said, in the course of an interview over the Blue Network.

Wallace Includes Medical Care in "Bill of Rights"

Before the Senate Commerce Committee, which voted 14 to 5 against President Roosevelt's nomination of Henry Wallace as secretary of commerce, Mr. Wallace expounded his economic bill of rights, sixth item of which was "the right to adequate medical care and the opportunity to achieve and enjoy good health." "As Selective Service has revealed," Mr. Wallace said, that "too large a proportion of our younger men now fall below reasonable health standards, this is a warning signal to America with respect to the state of health of all segments of our population. This condition calls for immediate and drastic

action. We must see that medical attention is available to all the people. But this health program must be achieved in the American way. All persons should have the right to go to the doctor and hospital of their own choosing. The federal and state governments should work hand in hand making health insurance an integral part of our Social Security program just as old age and unemployment benefits are today. We need more hospitals and doctors. We should make sure that such facilities are available and that we build hospitals in every community, rural and urban, that does not now have such facilities for all of its people. We must not be content to provide medical attention for people after they become sick. We must implement and extend our knowledge of maximum health as well as prevention of sickness. The government should appropriate needed funds to finance a greatly expanded program of medical research in private and public institutions."

Medical Legislation

MEDICAL BILLS IN CONGRESS

Bills Introduced.—S. 406, introduced by Senator Downey, California, provides for health programs for government employees and contemplates the utilization of osteopathic services in connection with any care to be provided government employees under the bill. H. R. 1666, introduced by Representative Rogers, Massachusetts, provides for the registration, selection and induction into the armed forces of qualified graduate female nurses. H. R. 1699, introduced by Representative Short, Missouri, proposes the establishment of an Optometry Corps in the Medical Department of the United States Army. H. R. 1688, introduced by Representative Davis, Tennessee, would authorize the President to appoint as commissioned officers in the Medical Corps of the Army and the Medical Corps of the Navy, on recommendation of the Surgeon General of the Army or the Navy, as the case may be, x-ray technicians who are regularly registered to practice as such in any state or the District of Columbia. H. R. 1661, introduced by Representative Rogers, Massachusetts, proposes the establishment of a permanent Veterans Medical and Hospital Corps in the Veterans Administration. This corps will consist, it is contemplated, of a Medical Corps, a Nurse Corps, a Corps of Laboratory Technicians, a Corps of Physical Therapists and Occupational Therapists, a Corps of Pharmacists, a Corps of Dietitians, a Corps of Librarians and a Corps of Social Workers. H. J. Res. 23, introduced by Representative Voorhis, California, proposes to establish the first week in October of each year as National Employ the Physically Handicapped Week. S. 143, introduced by Senator Thomas, Utah, provides that commissioned and warrant officers placed in St. Elizabeths Hospital or in certain United States Public Health Service hospitals shall be liable to pay such rate per day as may be prescribed by the President. H. R. 1764, introduced by Representative Chapman, Kentucky, proposes to amend the Insecticide Act of 1910 so as to provide that any white powder insecticide or fungicide containing arsenic in its elemental form or any of its combinations, or fluorine in any of its combinations, shall, unless deemed unnecessary by the Secretary of Agriculture for the protection of public health, be considered to be adulterated unless it is distinctly colored in accordance with regulations promulgated by the Secretary. H. R. 584, introduced by Representative Rogers, Massachusetts, provides that any World War ex-serviceman shown to have active pulmonary tuberculosis of a compensable degree shall be deemed to be totally disabled for purposes of compensation when hospitalized. H. R. 599, introduced by Representative Springer, Indiana, proposes to amend the existing law so as to prohibit the requirement of the taking of the so-called pauper's oath by certain applicants for hospital treatment or domiciliary care under veterans' laws. H. R. 592, introduced by Representative Spence, Kentucky, proposes to establish in the United States Public Health Service a division to promote water pollution control activities. S. 293, introduced by Senator Wagner, New York, for himself and Senator Wheeler, Montana, and H. R. 1102, introduced by Representative Jennings, Tennessee, propose to amend the Railroad Retirement Acts and the Railroad Unemployment Insurance Act so as to provide, among other things, sickness and maternity benefits for employees. This legislation would authorize the administrative board to enter into agreements or arrangements with doctors, hospitals, clinics or other persons for securing the examination, physical, medical, mental or otherwise, of persons claiming, entitled to or receiving sickness or maternity benefits and the performance of services or the use of facilities in connection with the execution of the statements of sickness which must be filed by employees to obtain the benefits. H. R. 1658, introduced by Representative Philbin, Massachusetts, proposes to amend the Selective Training and Service Act so as to provide that medical statements be furnished, without request therefor, to persons discharged from the armed forces for disability. S. 200, introduced by Senator Russell, Georgia, provides for federal assistance in the maintenance, expansion and operation of school lunch and school milk programs. The bill would make available for the purposes indicated the sum of $65,000,000 for the fiscal year ending June 30, 1945, and for each fiscal year thereafter such sums as may be necessary but not to exceed $100,000,000 for any one fiscal year. H. R. 1209, introduced by Representative Walter, Pennsylvania, and H. R. 1108, introduced by Representative Abernethy, Mississippi, propose to establish uniform procedure relative to the proof of age or place of birth or of death. H. R. 1380, introduced by Representative Reed, New York, proposes to exempt certain religious, charitable, scientific, literary and educational organizations from the requirement of withholding tax at source on wages. H. R. 662, introduced by Representative Cannon, Florida, would amend the Social Security Act to authorize the payment of federal old age and survivors' insurance benefits to certain individuals who become permanently and totally disabled before attaining the age of 65. H. R. 1416, introduced by Representative Angell, Oregon, provides for the payment of annuities to blind persons. H. R. 313, introduced by Representative McMillan, South Carolina, provides for a uniform allowance for members of the Army Nurse Corps. H. R. 536, introduced by Representative Peterson, Florida, provides that a veteran's compensation, pension or retirement pay shall not be reduced during his hospitalization or domiciliary care.

DISTRICT OF COLUMBIA

Bills Introduced.—S. 125, introduced by Senator Bilbo, Mississippi, and H. R. 322, introduced by Representative Randolph, West Virginia, provide for the disposition of funds collected by the District of Columbia examining, licensing and other boards and commissions, including the Commission on Licensure to Practice the Healing Art. This legislation provides that fees and charges for licenses, permits, examinations, certificates and registrations shall be paid to the Collector of Taxes and by him deposited in the Treasury of the United States to the credit of the District of Columbia. H. R. 1625, introduced, by request, by Representative Randolph, West Virginia, provides for the abolition of the office of coroner and for the organization of the office of medical examiner for the District of Columbia.

STATE LEGISLATION

Massachusetts

Bills Introduced.—S. 273, to amend those provisions of the medical practice act relating to the limited licensing of interns and medical officers in hospitals maintained by the state or governmental subdivision, proposes also to permit such limited registration to a fellow and to interns, fellows or medical officers in private hospitals and in clinics. H. 372 proposes to establish a cash sickness compensation act to provide compensation for wage losses due to unemployment on account of sickness. H. 673 proposes to direct the department of public health to make an investigation and study relative to the decay of teeth resulting from a lack of fluorine.

Wyoming

Bill Introduced.—H. 47 proposes to authorize the state board of health to cooperate with the United States Public Health Service and the Children's Bureau in matters related to the prevention, treatment and control of diseases and to accept relevant grants which may be made by the United States, any of its agencies, or a private agency or foundation.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Changes in Health Officers. — Dr. Philip A. Bearg has been appointed health officer of San Luis Obispo County to succeed Dr. Harrison Eilers, who resigned to accept a similar position in Long Beach (THE JOURNAL, Nov. 25, 1944, p. 845). ——Dr. William L. Denton, Bridgeport, has been named health officer of Mono County.

Physician Faces Imprisonment on Abortion Charge.— The San Francisco *Bulletin* recently reported that Charles Bacon Boudwin, Los Angeles, and his nurse, Mrs. Ella Berry, faced prison sentences of two to five years after they had been found guilty by a superior court jury of performing an abortion on a woman a year ago. Dr. Boudwin's license to practice medicine was revoked June 28, 1944 (THE JOURNAL, Aug. 19, 1944, p. 1153).

Changes in the Faculty at Stanford.—Among the recent changes on the staff of Stanford University School of Medicine, San Francisco, are the following:

Capt. Philip K. Gilman (MC), on leave of absence with the Navy, to clinical professor of surgery emeritus.

Dr. George W. Hartman to assistant clinical professor of surgery (genitourinary) emeritus.

Dr. Mary I. Preston to assistant clinical professor of pediatrics emeritus.

Dr. C. Frederic Fluhmann to associate clinical professor of obstetrics and gynecology.

The Musical Sons of Aesculapius. — Dr. Willard Lee Marmelszadt, intern at the Queen of Angels Hospital, Los Angeles, recently received the William Osler Medal of the American Association of the History of Medicine for a musical opus which has been deemed a noteworthy contribution to medical history. The work, entitled "The Musical Sons of Aesculapius," was begun while he was a student at Tulane University of Louisiana School of Medicine, New Orleans, where he graduated in 1944.

FLORIDA

Public Health Election.—Dr. Wieland W. Rogers, Jacksonville, was chosen president of the Florida Public Health Association at its recent annual meeting in Gainesville. Other officers included Dr. George A. Dame, Jacksonville, and Russell Broughman, sanitary engineer, Miami, vice presidents, and Dr. Edward M. L'Engle, Jacksonville, secretary-treasurer.

Personal.—Ross A. McFarland, Ph.D., medical coordinator of Pan American World Airways System, is in Miami conducting investigations in connection with alleviating crew and passenger fatigue on long range high altitude flights. Dr. McFarland, who is connected with the division of industrial research at Harvard Medical School, Boston, also is working on the control of insect borne infectious diseases by means of built in fumigating apparatus.——Dr. Herbert L. Bryans, Pensacola, was elected chairman of the Medical Advisory Committee of the State Rehabilitation Service at its organizational meeting held in Jacksonville recently. Other members of the committee are Drs. Frank L. Fort and Henry Hanson, Jacksonville; James L. Anderson, Miami, and Rollin D. Thompson, Orlando.

GEORGIA

Abner Calhoun Honored.—On December 21 the Fulton County Medical Society voted to name the Assembly Hall of the Academy of Medicine in memory of the late Dr. Abner Wellborn Calhoun, father of Dr. F. Phinizy Calhoun, Atlanta. The one hundredth birthday of Dr. Calhoun will be observed by Emory University School of Medicine in April with an ophthalmic seminar (THE JOURNAL, January 13, p. 110). The rededication of the assembly hall in honor of him will be a feature of the seminar.

ILLINOIS

New Chief of Tuberculosis Control. — Dr. Clifton F. Hall, Big Rapids, Mich., has been appointed chief of the division of tuberculosis control of the Illinois State Department of Public Health, effective January 15. Dr. Hall, who graduated at the University of Louisville School of Medicine in 1930 and the Harvard School of Public Health with a master in public health degree in 1938, has served five years as director of the division of tuberculosis control of the Kansas State Board of Health and five years as health officer of the local bicounty health department that serves Mecosta and Osceola counties with headquarters at Big Rapids, Mich.

Chicago

Clinical Conference Canceled. — The Chicago Medical Society announces that its second annual clinical conference, scheduled to be held February 27-March 1 at the Palmer House, has been canceled.

Industrial Meeting.—The Chicago Society of Industrial Medicine and Surgery held its midwinter scientific meeting at the Palmer House, January 29. Dr. Vinton E. Siler, Cincinnati, spoke, among others, on "Infections of the Hand."

Personal. — Mr. Patrick H. Costello, secretary of the National Association of Boards of Pharmacy, 77 West Washington Street, Chicago 2, has been elected to fill the vacancy on the board of trustees of the United States Pharmacopeial Convention caused by the recent death of Evander F. Kelly, Phar.D. (THE JOURNAL, Nov. 11, 1944, p. 715).——Miss Evelyn G. Johnson on November 22 was appointed executive secretary of the Chicago Hospital Council.

Refresher Course in Otolaryngology.—The fifth semiannual refresher course in laryngology, rhinology and otology will be conducted by the University of Illinois College of Medicine, March 26-31. While the course will be largely didactic, some clinical instruction will be included. This course is intended primarily for ear, nose and throat specialists. As the registration is limited to thirty, applications will be considered in the order in which they are received. The fee is $50. When writing for application please give details concerning school and year of graduation, and past training and experience. Dr. Abraham R. Hollender is chairman of the Refresher Course Committee, Department of Otolaryngology, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12.

Advisory Council on Hematology Research.—A medical advisory council has been appointed for the Hematology Research Foundation to assist in the allocation of its funds and related medical problems. Members of the council include:

Dr. Raphael Isaacs, director of the hematology department, Michael Reese Hospital.

Dr. Louis R. Limarzi, assistant professor of medicine, University of Illinois College of Medicine.

Dr. Andrew C. Ivy, Nathan Smith Davis professor of physiology and pharmacology and head of the department, Northwestern University Medical School.

Dr. Ludvig Hektoen, emeritus professor of pathology (Rush) University of Chicago School of Medicine.

Dr. Anton J. Carlson, professor emeritus of physiology, University of Chicago School of Medicine.

Dr. Italo F. Volini, dean of Loyola University School of Medicine.

Dr. Otto Saphir, pathologist of Michael Reese Hospital.

The objective of the Hematology Research Foundation, which was organized in 1944 (THE JOURNAL, May 13, 1944, p. 159), is to seek a cure or successful treatment for pernicious anemia, Hodgkin's disease, leukemia and other blood disorders through scientific research. Officers of the foundation include Mrs. Phillip Marcus, president; Mrs. Joseph Reader, treasurer, and Mrs. Jack Hornstein, executive secretary.

IOWA

Outbreak of Trichinosis.—What was said to be the state's greatest outbreak of trichinosis in ten years was reported in Lowden, January 12. Forty-three residents of the Lowden community area ranging in age from 8 to 65 years were ill at the time of this report. No deaths had been recorded.

KANSAS

Bulletin Taken Over by Menninger Foundation.—The *Bulletin* of the Menninger Clinic in Topeka was recently taken over by the Menninger Foundation, a nonprofit organization to further psychiatric research, education and treatment. The board of editors will remain the same and the bulletin will continue to publish articles on psychiatry, psychosomatic medicine, psychology and related clinical fields.

Venereal Disease Central Registry.—Harry L. Hinson Jr., assistant sanitarian, U. S. Public Health Service Reserve, has been assigned to the division of venereal disease control, Kansas State Board of Health, Topeka, to set up and operate a venereal disease central registry. According to the *News Letter*, all reported cases of venereal disease in the state will clear through the central registry and will be tabulated by Mr. Hinson.

The Hertzler Lecture.—Dr. Warren H. Cole, professor and head of the department of surgery, University of Illinois College of Medicine, Chicago, delivered the tenth annual lecture under the Arthur E. Hertzler Lectureship at the University of

Kansas School of Medicine January 10. His subject was "Chronic Cystic Mastitis." In 1935 Alpha Upsilon of Phi Beta Pi established the Arthur E. Hertzler Lectureship in honor of Dr. Hertzler, Halstead. The lectureship is entirely supported by contributions of current active members of the fraternity.

MICHIGAN

Institute of Nutrition.—A new service organization has been established at the Michigan State College of Agriculture and Applied Science, East Lansing, to be known as the Institute of Nutrition, *Science* reports. It is planned to coordinate and integrate instruction and research in nutrition and to bring together workers in the field. The program in research and teaching of the college has been broadened to include the production, processing and consumption of food by man and animal. The institute will supply a contact between industry and the college to further research in food and nutrition and will supply the food industry with results from the laboratory. It in no sense competes with or supplants the research of the experiment station but rather will supplement it through additional funds. An administrative committee of seven has been named, with Carl F. Huffman, Ph.D., research associate of dairying at the college, as chairman.

Annual Clinic Day — Mount Carmel Mercy Hospital, Detroit, held its annual clinic day on January 31. Among the speakers were:

Dr. Carl S. Ratigan, Dearborn, chief of staff.
Dr. Roger V. Walker, president of the academy of surgery.
Dr. Franklin H. Top, Recent Experiences in Treatment of Poliomyelitis.
Dr. Elmer Hess, Erie, Pa., Hypertension from a Urologic Point of View.
Dr. Thomas H. McGavack, New York, Thiouracil in the Management of Thyrotoxicosis.
Dr. Ward F. Seeley, Hemorrhage of Late Pregnancy.
Dr. Henry K. Ransom, Ann Arbor, Carcinoma of Large Intestine.
Dr. Clement A. Smith, Diabetes in Children.
Dr. Max Thorek, Chicago, History and Clinical Application of Tubovalvular Gastrostomy.

Dr. Henry L. Smith was toastmaster at a luncheon meeting that was addressed by Dr. Leroy W. Hull, president, Wayne County Medical Society, Dr. Andrew S. Brunk, president of the state medical society, and Dr. Albert C. Furstenberg, Ann Arbor, on "Postwar Program for Medical Education." Dr. Edwin P. Jordan, Assistant Editor of THE JOURNAL, Chicago, addressed the evening dinner meeting at the Dearborn Inn on "Status of Medicine Today in Regard to Federal Control."

MINNESOTA

The Elias Potter Lyon Lecture.—On January 18 William C. Rose, Ph.D., professor of biochemistry, University of Illinois, Urbana, Ill., delivered the Elias Potter Lyon Lecture at the University of Minnesota Medical School, Minneapolis. His subject was "The Amino Acid Requirements of Man."

New Lectureships Created at Minnesota.—The J. B. Johnston lectureship in neurology has been created at the University of Minnesota Medical School, Minneapolis, from a gift from Dr. Johnston's widow, Mrs. J. B. Johnston, Los Altos, Calif. The lectureship is named to honor John B. Johnston, Ph.D., who served as professor of comparative neurology in the medical school from 1908 to 1915 and dean of the College of Science, Literature and the Arts from 1914 to 1937. It is planned to invite to the medical school annually a prominent neurologist to present the lecture. Announcement is also made of the new Leo G. Rigler lectureship in radiology endowed at the medical school by a group of friends and colleagues of Dr. Rigler, professor and head of the department of radiology, in recognition of his contributions to the teaching and practice of medicine, particularly in the field of radiology.

Another Citizens Aid Gift for Cancer.—In the recent final distribution of the assets of the Citizens Aid Society, Minneapolis, the trustees set aside funds totaling about $16,000 to complete several research projects of the University of Minnesota Medical School, Minneapolis, which they had agreed to support. In addition the trustees set up a fund to provide $12,000 annually for a period of ten years for the support of the Cancer Institute at the university. The Citizens Aid Society has for thirty years been supporting various cultural, educational and welfare activities in Minneapolis. Cancer has been one of the special interests of the society since 1924, when the trustees provided funds to construct the Cancer Institute addition to the University Hospital. The institute is a memorial to Mr. George Chase Christian, the son of Mr. Henry Christian, who established and endowed the Citizens Aid Society. Mrs. George Chase Christian is president.

MISSOURI

Personal.—Dr. Harriet H. S. Cory, St. Louis, executive director of the Missouri Social Hygiene Association, is visiting Puerto Rico, Cuba, Haiti and the Virgin Islands as a representative of the American Social Hygiene Association, assisting Kenneth Miller, Caribbean representative, in the organization of several local hygiene associations for the prevention of social diseases, according to the Pan American World Airways.

Medical School Addition.—St. Louis University School of Medicine, St. Louis, plans a $500,000 addition to its $2,600,000 postwar expansion program. Plans have been completed and work will be started on the medical school immediately on release of permission by the War Production Board, according to the *Journal of the Missouri State Medical Association*. The building will be four stories of brick and stone and will contain an amphitheater with accommodations for the entire student body.

Portrait of Hal Foster.—The Kansas City Society of Ophthalmology and Oto-Laryngology will present an oil painting of Dr. Hal L. Foster, Kansas City, to the American Academy of Ophthalmology and Otolaryngology. The presentation is to take place during the 1945 session of the academy, when the group will observe its fiftieth anniversary, provided the meeting is held. The national organization was founded by Dr. Foster at a meeting in Kansas City in April 1896. He held the office of secretary from 1896 through 1898 and became vice president in 1920. As it is planned to exhibit the picture at each annual meeting, it will be placed where it will be a reminder to the academy members of the man who founded the organization. At the 1944 annual session of the academy Dr. Foster was elected to the Honor Section.

NEW YORK

Hospital News.—Under the will of Mrs. K. B. Hofheinz, Rochester, the Rochester General Hospital, Rochester, will receive a bequest of $8,000 for the children's department.

Personal.—Dr. Joseph H. Beattie, who has been practicing in the Greenburgh vicinity for forty years, was guest of honor at a dinner given by the medical staff of the Dobbs Ferry Hospital, Dobbs Ferry, of which he is a former president.

New York City

Work on Osteomyelitis with Penicillin.—The Hospital for Joint Diseases is conducting a special study on the treatment of acute and chronic osteomyelitis patients with penicillin. Physicians are requested to refer such patients to the hospital.

The Harvey Lecture.—George Wells Beadle, Ph.D., professor of biology, Stanford University, Calif., will deliver the fifth Harvey Society Lecture of the current series at the New York Academy of Medicine, February 15. His subject will be "The Genetic Control of Biochemical Reactions."

The Williams Assistantships in Obstetrics and Gynecology.—The Rockefeller Foundation has given a grant to Cornell University Medical College and the New York Hospital to establish the J. Whitridge Williams Assistantships in obstetrics and gynecology. The positions are specifically designed for postwar training of a selective group that military service has deprived of advanced training comparable to that possible in the prewar period, according to *Science*.

Hospital News.—Work has begun on an expansion program at the New York Hospital to increase the number of beds from 977 to 1,138. Material and equipment priorities were granted by the War Production Board, and work is to be completed by the middle of the summer. The program will cost about $600,000 but will not require the construction of any new unit. A formerly unused floor will be developed for use, and other sections of the building will be altered and rearranged.

The Biggs Memorial Lecture.—Fred C. Bishopp, Ph.D., assistant chief in charge of research, bureau of entomology and plant quarantine, U. S. Department of Agriculture, Washington, D. C., will deliver the annual Hermann M. Biggs Memorial Lecture at the New York Academy of Medicine April 5. The lecture, which is under the auspices of the committee on public health relations of the academy, will be on "Medical and Public Health Importance of the Insecticide DDT."

Society Receives Gift — At the meeting of the Medical Society of the County of Kings, December 19, Mrs. James M. Kingsley, Boonton, N. J., niece of the late Dr. Joseph H. Hunt, presented to the society the silver trowel used at the

cornerstone laying of the society building on Nov. 10, 1898. This trowel was used by Dr. Hunt, then president of the society. Mrs. Kingsley also gave the society the silver mounted gavel presented to Dr. Hunt, as president, at the 79th annual meeting, held Jan. 15, 1900.

Convicted for Abortion.—Dr. Charles Victor Dukoff was sentenced on December 15 to serve from two to four years in Sing Sing on each of five counts charging him with performing abortions and for which he had been convicted a week earlier. The sentences are to run concurrently. The physician was said to be indicted after a raid on his office last January, after which he was charged with the conduct of a "wholesale" abortion practice. It was said that he had received from $150 to $250 for each abortion.

Diagnostic Service for Tropical Diseases.—The New York City Department of Health has established a tropical disease diagnostic service which provides both laboratory and clinical facilities and has the advice and assistance of the specialists on the tropical disease staff of the DeLamar Institute of Public Health, Columbia University. Dr. Wheelan D. Sutliff, assistant director of the bureau of laboratories, is in charge of the laboratory work, and Dr. Howard B. Shookhoff of the bureau of preventable diseases is in charge of the epidemiology aspects. The address of the tropical disease diagnostic service is 600 West 168th Street, Room 704, New York 32.

OHIO

Personal. — Dr. Alice M. Bustin, Columbus, has been appointed medical member of the state board of cosmetology for a term ending Nov. 1, 1947. She succeeds Major Thomas D. Santurello, M. C., who has been in the medical corps of the army for more than two years.

Commonwealth Grant for Work on Chemical Factors in Disease.—The Commonwealth Fund of New York has allocated $32,600 to assist Enrique E. Ecker, Ph.D., professor of immunology, Western Reserve University School of Medicine, Cleveland, and the Institute of Pathology, to continue his work for two more years on the "chemical factors involved in the resistance to disease." The grant will enable Dr. Ecker to add a physical chemist to his staff.

Faculty Appointments at Ohio University.—Dr. George H. Ruggy, assistant professor of physiologic chemistry and pharmacology, has been appointed to the new position of junior dean in the Ohio State University College of Medicine, Columbus. Dr. Bruce K. Wiseman has been appointed chairman of the department of medicine, succeeding Dr. Charles A. Doan, who was recently named dean of the medical school (THE JOURNAL, Dec. 16, 1944, p. 1041). Dr. Ruggy graduated at the University of Chicago School of Medicine in 1940 and has been a member of the staff of Ohio State since 1932, serving successively as graduate assistant, instructor and assistant professor except while he was at the University of Chicago and the year 1940-1941, when he was house officer at Blodgett Memorial Hospital, Grand Rapids, Mich. Dr. Wiseman graduated at the Indiana University School of Medicine, Indianapolis, in 1928; he has been a member of the Ohio staff since 1930, serving first as assistant professor of medical research. In 1936 he was named associate professor and in 1939 professor.

PENNSYLVANIA

Pittsburgh

Course in Slit Lamp Microscopy.—The committee on graduate education of the Allegheny County Medical Society is offering a course in slit lamp microscopy of the living eye, combined with a course in glaucoma surgery. Instruction will be by the department of ophthalmology of the Montefiore Hospital under the direction of Dr. Harvey E. Thorpe and his associates. The course will begin February 12 and run for three consecutive days. Information may be obtained from the committee on graduate education, Allegheny County Medical Society, 5092 Jenkins Arcade Building, Pittsburgh 22.

TEXAS

Grants to University.—The John and Mary R. Markle Foundation of New York has given a grant of $2,500 to support the work of Eric Ogden, B.Sc., professor of physiology, University of Texas Medical Branch, Galveston, on blood flow and hypertension and a grant of $3,300 for the support of studies on filariasis to be made by J. Allen Scott, Sc.D., associate professor of epidemiology and preventive medicine at the university.

Clinical Significance of Rh Factors.—A conference on the clinical significance of Rh factors will be held at the University of Texas Medical Branch, Galveston, February 9-10. The conference has been called at the suggestion of laboratory workers and Texas military hospitals. It will be under the general direction of John G. Sinclair, Ph.D., professor of anatomy, and Dr. Henry H. Sweets Jr., director of the John Sealy Clinical Laboratories.

WASHINGTON

Recommendations for Medical School. — The present legislature has been asked to appropriate $450,000 to maintain the proposed school of medicine and dentistry at the University of Washington, Seattle. This sum, it is expected, would maintain the school for two years. At ensuing sessions of the legislature it is hoped to obtain additional appropriations of $3,700,000 for maintenance and improvement. The Washington State Medical Association is sponsoring this project, which would consist of a standard four year course of instruction in medicine and dentistry. The present buildings, laboratory, library and other facilities of the university will allow the accommodation of 50 students in medicine and 50 in dentistry in the school year of 1946 if funds, largely for faculty salaries, are made available now. The project has been under consideration for a long period by committees of the state association in conjunction with the board of regents and the president of the university (THE JOURNAL, July 1, 1944, p. 666; December 2, p. 907).

State Health Department Reorganized.—Dr. Arthur L. Ringle, who has been serving in full time public health work in local health departments in Washington for a number of years, has been appointed director of the state department of health, Seattle. The position has been filled by Dr. John A. Kahl, assistant health director since Dr. Leland E. Powers was called to active duty by the U. S. Public Health Service on Dec. 15, 1944, for assignment to the United States Relief and Rehabilitation Administration. The state department of health has been reorganized into four functional divisions: division of preventive medical services, in charge of Dr. John L. Jones with the title of chief; the division of central administration, in charge of Dr. Ringle as state director of health; the division of public health engineering, with M. S. Campbell, C.E., serving as chief, and the division of local health services, with Dr. Kahl serving as chief of the division and assistant state director of health. The division of preventive medical services includes the communicable disease control section, in charge of Dr. Austin U. Simpson; the maternal and child hygiene and crippled children's section, in charge of Dr. Jones as acting head; the industrial and adult hygiene section, with Dr. Lloyd M. Farner as head; the mental hygiene section, a newly created unit, with Dr. George C. Stevens in charge (THE JOURNAL, Dec. 2, 1944, p. 907), and the dental hygiene section, with Francis I. Livingston, D.D.S., in charge. Dr. Ringle graduated at University of Colorado School of Medicine, Denver, in 1935.

WEST VIRGINIA

Personal.—Dr. Charles N. Scott, who has been serving as plant physician for the American Viscose Company at Nitro, has resigned to enter the Navy. Dr. John F. Cadden, who has been serving on the Viscose medical staff, with headquarters at Wilmington, Del., has been named acting plant physician.——Dr. Joseph P. Webb, instructor in medicine and research fellow in aviation medicine at the University of Cincinnati College of Medicine, has been appointed internist and medical director of the Chesapeake and Ohio Hospital, Huntington.

GENERAL

Conference on Medical Service Canceled.—The National Conference on Medical Service, scheduled to be held February 11 in Chicago, has been canceled in compliance with a request received from the Office of Defense Transportation.

Cancer Society Changes Address.—The American Cancer Society announces that its new address is 350 Fifth Avenue, Room 1211, New York 1. The new executive council of the society, under the chairmanship of Eric A. Johnston, plans to conduct a campaign to raise $5,000,000 for research.

Journal of Clinical Psychopathology.—The Association for the Advancement of Psychotherapy announces that its official organ is the *Journal of Clinical Psychopathology and Psychotherapy*, formerly *Journal of Criminal Psychopathology*. The chief editor of the journal is Dr. Vernon C. Branham, Box 631, Monticello, N. Y. Dr. Emil A. Gutheil, 16 West 77th Street, New York 24, is secretary-treasurer of the association.

Special Society Elections.—Recently elected officers of the Central Neuropsychiatric Association include Drs. Abram E. Bennett, Omaha, president; Edwin Rogers Smith, Indianapolis, vice president, and William C. Menninger, Topeka, Kan., secretary-treasurer.——Dr. Walter A. Sternberg, Mount Pleasant, Iowa, was named president-elect of the Mississippi Valley Medical Society recently and Dr. Grayson L. Carroll, St. Louis, was installed as president. Other officers include Drs. Louis H. Jorstad, St. Louis, Elmer E. Nystrom, Peoria, Ill., and Ernest J. Lessenger, New London, Iowa, vice presidents and Harold Swanberg, Quincy, Ill., secretary-treasurer.

Society for the Study of Sterility Formed.—The recent organization of the American Society for the Study of Sterility has been announced with Drs. Walter W. Williams, Ithaca, N. Y., chairman, and John O. Haman, 490 Post Street, San Francisco 2, secretary-treasurer. These two physicians, with the following, constitute the board of directors: Drs. Edwin C. Hamblen, Durham, N. C.; Lewis Michelson, San Francisco; Abner I. Weisman, New York; Lyman W. Mason, Denver, and Edwin M. Robertson, Kingston, Ont. The objectives of the society are:

The encouragement of scientific investigation of fertility and infertility.
The improvement of the diagnosis and treatment of infertility.
The correlation and dissemination of the information obtained from these studies.

Foundation for Mentally Abnormal Children.—The authorities of the state of New York have accepted the filing of the certificate of incorporation of a new national child care organization to be known as the Foundation for Child Care and Nervous Child Help, Inc., which will start its activities in the near future. The general purpose of the foundation is the advance of work to help mentally sick children. Research projects will be started and supported and various publications undertaken. President of the board of directors of the new foundation is Dr. Leo Kanner of Johns Hopkins University School of Medicine, Baltimore. Ernest Harms, editor of the journal the *Nervous Child*, New York, is executive director. The foundation has its office at 30 West 58th Street, New York 19. As a major task the foundation intends to create a public school of exceptional children in New York, developed in such a way that it can be used as a sample for similar institutions in other cities. There is also planned an institution for the treatment of prepsychotic and predelinquent children. Connected with both institutions will be a training school for nurses, teachers and social workers for the care of subnormal children.

Awards for Work in Fertility of Human Beings.—John MacLeod, Ph.D., research associate in anatomy, Cornell University Medical College, New York, received a cash award of $500 during the twenty-fourth annual meeting of the Planned Parenthood Federation of America at the Waldorf-Astoria, New York, January 24. The award was made possible by the Albert and Mary Woodard Lasker Foundation for his scientific research in the motility of human sperm cells. In simple terms Dr. MacLeod has determined not only what factors cause the sperm cells to travel at the rate of about a quarter of an inch in two minutes in a congenial medium but the substance which may increase or decrease this activity. Because of this discovery it may be possible after further research to speed up or slow down the rate of speed of sperm cells, the former invaluable in the correction of infertility, the latter in the control of fertility. Honorable mentions went to Dr. Samuel L. Siegler, Brooklyn, for his volume on "Human Fertility in the Female" and to Dr. Robert S. Hotchkiss, New York, for his volume on "Human Fertility in the Male." Dr. Felix J. Underwood, executive officer, Mississippi State Board of Health, Jackson, will receive a second $500 award for his state's achievement in including planned parenthood services as an integral part of its public health programs of maternal care. This action on the part of the Mississippi health department in 1944, under the direction of Dr. Underwood, brings to six the number of states officially making planned parenthood a normal part of their public health program.

Narcotic Violations.—The Bureau of Narcotics, Treasury Department, Washington, D. C., reports the following narcotic violations and the action indicated:

Dr. Brady H. Hughes, Birmingham, Ala., pleaded nolo contendere, Oct. 25, 1944, to a charge of falsely making narcotic prescriptions; placed on probation for one year.

Dr. Lyman W. Gay-Lord, formerly of Baltimore and of Bridgeport, Conn., and recently located in Newark, N. J., was convicted in the state court of Connecticut April 13, 1944, of violation of the state narcotic law; sentence of one year in jail suspended.

Dr. Stephen A. Peters Jr., Gainesville, Ga., pleaded guilty Oct. 23, 1944, to violation of the federal narcotic law; sentenced Oct. 27, 1944, to a term of fifteen months.

Dr. Frank Morse Nichols, Warsaw and La Grange, Ind., pleaded guilty Nov. 3, 1944, to a violation of the federal narcotic law; placed on probation for one year.

Dr. Fred A. Stahl, Springfield, Mo., convicted of violation in the U. S. District Court at Springfield, of narcotic laws, Jan. 28, 1944, and sentenced to serve a term of two years. In October the circuit court of appeals for the eighth circuit affirmed the decision of the lower court, which had been appealed by the physician.

Dr. Guy S. Bryan, Silver City, Miss., pleaded guilty in the U. S. District Court, Jackson, Miss., May 8, 1944, to violation of false execution of narcotic prescriptions; sentenced to serve a term of eighteen months.

Dr. D. Duane Parrish, East Syracuse, N. Y., received on April 13, 1944 a suspended sentence of six months following his plea of guilty to a violation of the federal narcotic laws; placed on probation for two years with the understanding that he would not deal in narcotics during that time.

Dr. Linwood H. Justis, Littleton, N. C., sentenced to a term of one year and one day, effective Oct. 16, 1944, for violation of the federal narcotic laws.

Dr. John A. Bentley, Allen, Okla., received a suspended sentence of six months on Oct. 2, 1944 following a plea of guilty to violation of federal narcotic laws; placed on probation for five years.

Dr. Raymond A. Thompson, Pittsburgh, pleaded guilty in Erie, Pa., May 23, 1944 to violation of the federal narcotic law and was sentenced to imprisonment for a term of two years.

Dr. John Jacob Dominick, Prosperity, S. C., pleaded guilty to violation of the federal narcotic law May 8, 1944 and was sentenced to a term of nine months in prison or to pay a fine of $500; the fine was paid.

Dr. Wendell Cotton, Rock Springs, Wyo., pleaded guilty at Cheyenne, Wyo., on May 22, 1944 to violation of the federal narcotic law and was sentenced to imprisonment for three years.

CORRECTION

Shortage of Nurses.—The editorial in THE JOURNAL, January 6, referring to the shortage of nurses stated that the number of nurses now on duty was 47,478. This figure is in error, since the total number of nurses on duty with the Army is 42,000.

Government Services

Appointments of Medical Officers in Public Health Service

A limited number of appointments of medical officers in the Regular Corps of the U. S. Public Health Service will be made in grades above senior assistant surgeon (captain). Applicants must be citizens of the United States, must have been graduated from a recognized medical school and must have had at least twelve years of professional experience since graduation from medical school. The examination will consist of an evaluation of information furnished on application forms and questionnaires supplied by the Surgeon General at the request of the applicant, a report of physical examination by Public Health Service medical officers and a written professional examination in practice of medicine, practice of surgery, public health, and a thesis on a subject selected by the applicant. Candidates will be rated competitively. Applications must be made before March 1. Written examination will be held on March 8 and 9 at places approved by the Surgeon General.

Bill to Create Research Institute in Public Health Service

Hon. James E. Murray, U. S. Senator from Montana, on January 10 introduced a bill to establish a National Institute of Dental Research and to aid and encourage dental studies that will advance the prevention and treatment of dental diseases. It is proposed that the institute be established as a division of the National Institute of Health in the U. S. Public Health Service, an arrangement which would foster the development of dental research that is already being done by the public health service and other agencies, public or private, according to a statement of Senator Murray discussing the bill. If enacted, the Surgeon General of the Public Health Service would direct the new institute in its work with the assistance of a national advisory dental research council to include, in addition to the Surgeon General as chairman, six appointed members, at least four of whom shall be dentists. The institute would conduct and aid research on the cause, prevention and methods of diagnosis and treatment of dental diseases and conditions, promote coordination of dental research, provide fellowships in the institute and make grants-in-aid to universities and other institutions, secure the consultation services of other experts and cooperate with state health agencies. The bill proposes that Congress should authorize appropriations, up to a maximum of $1,000,000, to erect and equip a suitable building after the war, and up to a maximum of $730,000 a year to provide a budget to carry out the program. The institute would also be authorized to receive gifts from private sources

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 6, 1945.

Plan for Decentralizing London's Population

The unplanned growth of the largest city in the world has involved great evils. Between the two wars the population of greater London increased from 8,500,000 to 10,000,000. There was an orgy of house building, and new industries sprang up on sites unrelated to the shifting homes of the people. The average man of the new suburban housing estates travels 16 miles a day, at an annual cost of $60, to get to and from his work. London's uncontrolled expansion became a scamper over the adjacent counties which produced little more than a jumble of building, services and transportation facilities, involving a waste of social capital, productive effort and human health and strength, overrunning valuable farm land, open spaces and beauty spots and enlarging the wilderness of stone and brick in which men live in juxtaposition but not in community. This intolerable process could easily continue when building is resumed after the war. But damage due to bombing from the air has given an opportunity for planning the reconstruction of outer London; under government orders, an important plan has been drawn up by Professor Abercrombie.

The main aim is to discourage the further growth of population and industry in the London region and to provide for their better distribution. The magnitude of the task is shown by the fact that over a million persons are involved in the transfer. This decentralization of population is only one part of the problem. The conservation of good agricultural land and the preservation of the green belt of outer London are examined also. The area dealt with amounts to 2,717 square miles. The green belt is to provide primarily for the recreation of Londoners, and only small population increases in the towns which it contains are to be allowed. Outside this is the "outer country ring," which contains distinct urban communities situated in land otherwise open and mainly agricultural. Here will be the principal reception area for the decentralized population. Additions will be made to the existing towns, and eight new towns, with a maximum population of 60,000 each, are to be established. The plan also proposes improvements in London's road system. Our roads are reputed to carry the densest traffic in the world, with an appalling toll of deaths. The need for traveling could be diminished by locating workers near their places of work. At present there is no such arrangement.

First Woman Professor at Oxford an Ophthalmologist

Dr. Ida Mann, well known for her researches in embryology of the eye, has had the title of professor conferred on her by Oxford University as long as she remains Margaret Ogilvie's reader in ophthalmology. She will receive a salary of $10,000 as long as she refrains from private practice. This is the first time that a woman has been raised to the position of professor at Oxford. The appointment marks an important stage in the progress of the scheme for which the university has been collecting funds. Already $500,000 has been raised of the $1,250,000 required. The scheme is for research in the fundamental problems of vision, particularly biochemical problems.

Honor for Sir Thomas Lewis

The presidents of the Royal Society and the Royal College of Physicians have awarded the Conway Evans prize to Sir Thomas Lewis for his great contribution to our knowledge of the normal and abnormal mechanisms of the heart and circulation. The prize, in accordance with the will of the late Dr. Conway Evans, is awarded for noteworthy scientific work. It has previously been awarded to physiologists—first to Sir Charles Sherrington in 1927, then to J. S. Haldane in 1933 and also to Sir Gowland Hopkins in 1938. The infrequency of the award indicates the importance of the work for which the prize is given. Unlike the previous recipients, Sir Thomas Lewis has worked in a field which he calls "clinical science" and which may be described as the application of scientific advances to clinical problems.

An Eminent Medical Centenarian

Sir Thomas Barlow, known best for his description of infantile scurvy ("Barlow's disease"), has attained the age of 100. He makes his annual Christmas appeal as president of the Royal Medical Benevolent Fund.

AUSTRALIA

(From Our Regular Correspondent)

Nov. 4, 1944.

Medical Research in Australia

For many years there has been growing criticism of the failure of the National Health and Medical Research Council in Australia to foster medical research. There are two reasons for this. The first is the limitation of funds, which are only £30,000 a year, and the second is the composition of the council, made up of men eminent in the field of health administration. Only one of the members could be described as a research scientist. This criticism was voiced at the time the council was originally formed, when it took over the duties of the Federal Health Council. Invidious comparisons are being made between the Australian Council for Scientific and Industrial Research and the National Health and Medical Research Council. The former is guided by a body composed of men eminent in research. The many fields in which it has functioned have amply demonstrated during the war the benefits of the scientific caliber of its composition.

A thoughtful contribution to the problem has been made by J. V. Connolly in "Some Australians Take Stock," published by Longmans, Green & Co. The usual story is that a university graduate visits overseas countries in order to gain experience and to meet other scientists eminent in his field. When such men are asked subsequently why they do not return to Australia, the usual answer is "The facilities there are not good enough." It is felt that brains and scientific ability are not among the commodities we can afford to export. Inevitably there will be among English speaking countries some interchange of people possessing special qualifications. Indeed, in many cases the migrant has adapted his training so effectively to the environment of his adopted country that he has been able to contribute noticeably to its development, but in the present instance the exodus is not part of a natural interchange and really constitutes an undesirable and avoidable loss.

A study of the ultimate settling place of the Rhodes scholars of Australia reveals that of those who were selected prior to 1927 more than half the graduates in medicine are now residing outside Australia. The example taken from the movement of Rhodes scholars has its parallel in the considerable number of Australians who have gone abroad without any of the inducements provided by scholarship awards. More than two hundred graduates from the Australia university alone are more or less permanently settled in England at the present time. Tuition in Australia is satisfactory. Technical education in the various schools is of an extremely high standard, although general education is possibly less so. The tendency for graduates to go abroad is welcomed, but the trouble is that too many of them remain abroad, and the net result is that Australia loses an influence that she can ill afford to be without.

A study of the wider field of medical practice in Australia seems justified to see if some light can be thrown on this problem. The first question that might be asked is "Is the medical profession in Australia overcrowded?" There is 0.74 medical graduate per thousand of population in Australia. This can be compared with England, where the figure is 0.85 per thousand. The factor of distance should be remembered when considering the percentage of medical graduates in Australia, since there is not the same concentration of population that one finds in other countries. Bearing this geographic factor in mind, it is fair to say that Australia is far from being oversupplied with medical practitioners. And yet, in spite of the apparently uncrowded field in Australia, a considerable number of Australian surgeons were practicing abroad before the war, and it seems that the surgeon particularly is the one who is most anxious to leave Australia to practice overseas. One reason for this might be found in the high standard of training possessed by the medical graduate who takes up a small country practice in one of the Australian towns. It is the normal thing for him to do his own surgical work and to do it competently. Thus consulting surgeons in the city receive nothing like the same amount of general surgery that is sent to the surgeon, say, in England, where the general practitioner practices almost exclusively as a physician. Fees in Australia do not always compare favorably with those obtained by consulting surgeons abroad. There is a great disparity between the income of a leading surgeon in Sydney or Melbourne and the income of his counterpart in, say, London or New York. Also there seems to be reluctance in Australia to give to the man who has moved to the top of the profession the formal recognition that is accorded to him elsewhere, although this reluctance is not confined to medicine. One might sum up by saying that the Australian surgeon has less opportunity at home than he is able to find abroad, while men working as general practitioners, doing their own surgery, can make a much greater income than they would in most overseas practices. In Australia all the influences affecting the standards of the profession and other specialized occupations tend toward the production of a fairly uniform level. There is little encouragement of special aptitude and no particularly high reward for ambition. This insistence on uniformity is only a manifestation of the philosophy which pervades not only the national economy but the whole social fabric of the country. If the approximation of Jack to the same plane as his master does contribute to the well being of the majority, it also limits the upper level of achievement and in so doing contributes to the exodus of those who consider that their talents will be better rewarded abroad.

A study of the social background against which Australians live can throw some light on this problem. It is true that the average Australian working man is a good deal better off than his counterpart in almost any other community. But for the more highly educated man the position is somewhat different. A certain impatience with nonconformity and a noticeable tendency toward materialism seem to be the products of our social evolution. These things militate against the development of any national culture. Attention to this problem has been revived recently as an aftermath of the visit of Sir Howard Florey of Oxford University, co-discoverer of penicillin and now professor of bacteriology at the University of Oxford. It is significant that Sir Howard was a graduate of the University of Adelaide. He drew attention to the fact that Australian universities turned out well equipped young men with a flair for research, yet these men had to seek overseas fields for their work because the facilities in Australia were not good enough. The main difficulty, he felt, was that professors and others were overburdened with teaching and a good deal of outside work. They had no time to pursue research, and without research universities were lowered to the level of technical schools. Oxford University receives an annual government grant of something like £100,000 a year, and the Medical Research Council of Great Britain, subsidized by the state, had been able to undertake valuable research into war medical problems, Sir Howard said. This Council is controlled by scientists and protected from direct political interference. It is unfortunate that scientists, although strong in brain power, are weak in voting power. The result is that ministers of the government have a habit of expressing fervid agreement with their views and doing nothing.

The Australian Optical Industry

At the outbreak of war Australia had only a rudimentary munitions industry, which did not include the manufacture in quantity of precision optical instruments. This task was assigned by the Ministry of Munitions to the Ordnance Production Directorate, and a munitions optical panel was set up under the chairmanship of Professor T. H. Laby of Melbourne University. The first problem was the manufacture of optical glass, and commercial firms engaged in its production showed a reluctance to make available the necessary details and technic. Information, however, was freely offered by American scientists, and the production of optical glass in quantity was followed by the successful production of many types of optical munitions—telescopes, range finders, gun sights, directors, periscopes, stereoscopes and other material. Some of these products were of British design, and some have been optically and mechanically designed in Australia. Australian made lenses and prisms exported to the United States were not only part of reverse lend lease but were a recompense for the original information so willingly supplied by the United States. About one in four Australians wears spectacles, according to War Organization of Industry officials, who have been investigating the manufacture of Australian spectacles. The output of spectacle frames in the commonwealth is steadily rising, but lenses are still being imported in small quantities. It is hoped that an Australian firm formerly engaged in making gun sights and range finders will be able to produce all the lenses necessary for the new Australian spectacle industry.

Australian Record for a Blood Donor

Mr. W. J. Murphy, secretary of the South Australian Blood Transfusion Service, seems to have a claim for the record as a blood donor in Australia. In nine years he has given eighty-three blood transfusions totaling about 100 pints. He has given two donations in the same day and on another occasion gave three in two weeks. As a result of the latter his hemoglobin was reduced to 75 per cent, but in three weeks it returned to 95 per cent. Blood has always been taken by the needle method, and at no time has his vein been cut down on. He is 42 years of age and weighs nearly 13 stone (83 Kg.). He has never displayed any reaction to the procedure, and his statements are endorsed by the medical registrar of the Royal Adelaide Hospital, South Australia.

Marriages

LEON JAIR TAUBENHAUS, College Station, Texas, to Miss Marjorie Vera Polon in New York, November 18.

WILLIAM ROSS BUTTRAM JR., Chattanooga, Tenn., to Miss Augusta Lee Rees of Columbus, Ga., October 28.

PATRICK M. BERZITO, Mayfield, Pa., to Miss Dolores Margaret Johnson of Milwaukee, October 24.

FRANK R. STEELSMITH to Miss Julia E. Cockburn, both of Des Moines, November 1.

JAMES F. LEMMON to Miss Betty Neva Shriner, both of Akron, Ohio, October 12.

EDWARD KEZUR, Toledo, Ohio, to Miss Isabel Schecter of New York, October 29.

LEONARD V. GRATKINS to Miss Mabel Johnson, both of Chicago, November 16.

Deaths

Henry Greenwood Bugbee ✦ New York; Columbia University College of Physicians and Surgeons, New York, 1903; chairman of the Section on Urology of the American Medical Association, 1922-1923; founder member of the American Board of Urology; member, past president and secretary of the American Association of Genito-Urinary Surgeons, which in 1944 awarded him the Keyes Memorial Medal for his contributions to urology; member and past president of the American Urological Association; past president of the New York Urological Association; past president and secretary of the Clinical Society of Genito-Urinary Surgeons; served as president of the International Urological Association; fellow of the American College of Surgeons and the New York Academy of Medicine; member of the Quiz Medical Society, the Royal Medical Society of Budapest and the Société d'Urologie Française; member and past president of the alumni of St. Luke's Hospital, where he had interned from 1903 to 1906, retired Jan. 1, 1945 as director of urology and remained on the staff as consulting urologist; surgeon-in-chief Vassar Brothers Hospital, Poughkeepsie, N. Y., from 1906 to 1910 and later consulting urologist; served as urologist and president of the medical board at the Lawrence Hospital, Bronxville, and the Woman's Hospital; consulting urologist at the Mountainside Hospital, Montclair, N. J., Muhlenberg Hospital, Plainfield, N. J., and the Mather Memorial Hospital, Port Jefferson, N. Y.; author of numerous articles on urologic subjects, and a section in Lewis's Surgery; served on the board of editors of the *Journal of Urology;* died January 17, aged 63.

William Henry Keleher ✦ Woburn, Mass.; Harvard Medical School, Boston, 1892; president of the Middlesex East District Medical Society in 1913; formerly medical examiner of the fourth Middlesex district; president of the board of trustees of the Woburn Public Library; a director of the Woburn Cooperative Bank; chairman of the city board of health; school physician at St. Charles Parochial School; on the courtesy staff of the Winchester Hospital, Winchester, and on the staff of the Charles Choate Memorial Hospital; died December 4, aged 75, of carcinoma of the rectosigmoid.

William Abel Alton, La Mesa, Calif.; Lincoln (Neb.) Medical College of Cotner University, 1897; served during World War I; died in the Paradise Valley Sanitarium and Hospital, National City, November 16, aged 70, of bronchopneumonia following an operation for intestinal obstruction.

Glenn Andrews, Montgomery, Ala.; University of the City of New York Medical Department, New York, 1886; member of the American Medical Association; formerly member of the state board of censors; for eighteen years state prison inspector; died December 9, aged 82, of tuberculosis.

John Dean Boylan ✦ Milford Center, Ohio; Western Reserve University School of Medicine, Cleveland, 1916; past president, vice president and secretary of the Union County Medical Society; member of the Radiological Society of North America, Inc.; served overseas during World War I; formerly health officer of Mahoning and Union counties; died November 19, aged 54, of cerebral hemorrhage.

John Arthur Bundy, Hill City, Kan.; University Medical College of Kansas City, Mo., 1906; died November 26, aged 66, of coronary occlusion.

Edward P. Christensen ✦ Two Harbors, Minn.; Rush Medical College, Chicago, 1906; served as city and county health officer; medical superintendent and part owner of the Two Harbors Hospital; formerly member of the city council; first president of the Rotary Club; died November 10, aged 64, of coronary thrombosis.

John Alexander Clarke ✦ Greenwich, Conn.; Bellevue Hospital Medical College, New York, 1897; for many years medical examiner for Greenwich; school physician; on the staff of Greenwich Hospital, where he died November 23, aged 73, of Addison's disease.

Edward Ellison Coburn, Columbus, Ohio; Starling Medical College, Columbus, 1894; died November 5, aged 77, of heart block.

Joseph Hamilton Crampton, Seattle; University of Kansas School of Medicine, Kansas City, 1906; past president of the Idaho State Medical Association; served during World War I; died November 9, aged 60.

Edward W. Draper, Gainesboro, Tenn.; University of Tennessee College of Medicine, Memphis, 1935; member of the American Medical Association; died November 17, aged 36, of heart disease.

Frank Eugene Draper, Hyannis, Mass.; Harvard Medical School, Boston, 1886; member of the American Medical Association; a captain in the medical corps of the U. S. Army during World War I; formerly assistant ophthalmic surgeon at the Massachusetts General Hospital and the Boston Dispensary and clinical assistant at the Massachusetts Eye and Ear Infirmary, Boston; died November 23, aged 80, of arteriosclerotic heart disease.

Fred Clifford Eakins, Bannister, Mich.; Western University Faculty of Medicine, London, Ont., Canada, 1899; served during World War I; died in Leamington, Ont., Canada, November 10, aged 68, of carcinoma.

C. Francis Ewing, Wheaton, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1901; member of the American Medical Association; died in St. Francis Hospital, Breckenridge, November 28, aged 72, of coronary thrombosis.

Stanley Theodore Fortuine, Ogunquit, Maine; Columbia University College of Physicians and Surgeons, New York, 1916; fellow of the American College of Surgeons; served during World War I; interned at the Presbyterian Hospital in New York; formerly resident physician at the Mary McClellan Hospital in Cambridge, N. Y.; died November 11, aged 57, of angina pectoris due to coronary sclerosis.

George B. Frantz, Coal Center, Pa.; Cincinnati College of Medicine and Surgery, 1886; for many years president of the Peoples Bank and Trust Company in California; died in California November 14, aged 82, of carcinoma of the rectum.

George Bryan Frey, Spartanburg, S. C.; Medical College of the State of South Carolina, Charleston, 1930; on the staff, formerly an intern and resident physician at the Spartanburg General Hospital; interned at the Greenville City Hospital, Greenville; formerly on the staff of the South Carolina State Hospital, Columbia; died November 11, aged 49, of coronary occlusion.

Patrick Joseph Griffin ✦ Fertile, Minn.; Northwestern University Medical School, Chicago, 1913; served during World War I; at one time state food bacteriologist in the Chicago health department; served on the staffs of the Veterans Administration Facility at Hines, Ill., and Alexandria, La.; major, medical reserve corps, U. S. Army, not on active duty; died in the Veterans Administration Facility, Fargo, N. D., October 15, aged 64, of coronary arteriosclerosis and coronary occlusion.

Thomas Frederick Guffin, East Point, Ga.; Atlanta College of Physicians and Surgeons, 1912; member of the American Medical Association; on the staffs of the Grady Hospital and the Georgia Baptist Hospital, Atlanta, where he died November 22, aged 69, of uremia.

George L. Henderson ✦ Conway, Ark.; University of Arkansas School of Medicine, Little Rock, 1907; served during World War I; died November 23, aged 73, of hemiplegia.

Herman William Hesse ✦ Savannah, Ga.; University of Pennsylvania Department of Medicine, Philadelphia, 1900; served as president of the board of education, Kiwanis Club, the alumni associations of the University of Pennsylvania and the Newberry College and as chairman of the health committee of the city council; died November 24, aged 68, of cerebral hemorrhage and myocarditis.

Reuben Chandler Hill ✦ Exeter, Calif.; Medical Department of the University of California, San Francisco, 1901; died November 20, aged 69, of coronary occlusion.

Maximilian Horn, Scarsdale, N. Y.; Medizinische Fakultät der Universität Wien, Austria, 1903; served as dermatologist on the staff of the Vanderbilt Clinic at the Columbia-Presbyterian Medical Center, New York; died in the White Plains Hospital, White Plains, November 25, aged 65, of acute pancreatitis.

Thomas Franklin James, Chicago; Chicago College of Medicine and Surgery, 1916; died in the Mother Cabrini Hospital November 21, aged 67, of cardiac dilatation and lobar pneumonia.

John Franklin Jones, Linn, Mo.; Beaumont Hospital Medical College, St. Louis, 1889; member of the American Medical Association; died November 22, aged 81, of cerebral hemorrhage.

Avedis Herold Kaye, New York; University of Michigan Medical School, Ann Arbor, 1916; on the staff of St. Luke's Hospital; died November 15, aged 58, of cerebral hemorrhage.

William James Knight, Newport News, Va.; Medical College of Virginia, Richmond, 1897; member of the American Medical Association; on the staff of the Riverside Hospital; died November 15, aged 72, of coronary thrombosis.

Edgar Lucius Langrum, Los Angeles; Meharry Medical College, Nashville, Tenn., 1924; served an internship at the Kansas City General Hospital, Kansas City, Mo.; died November 24, aged 46, of acute dilatation of the heart (myocarditis).

Frank Ridgeway Leeds, Michigan City, Ind.; the Hahnemann Medical College and Hospital, Chicago, 1899; served two terms as county coroner; formerly on the staff of the Michigan City Sanitarium; died in Jackson, Mich., November 16, aged 71, of pneumonia.

John Rhodes Lewis ✠ Kansas City, Mo.; St. Louis University School of Medicine, 1925; interned at the Missouri Baptist Sanitarium in St. Louis; on the staff of the Research Hospital; died in St. Charles November 23, aged 48, of coronary thrombosis.

George Anderson MacElree, Philadelphia; Jefferson Medical College of Philadelphia, 1894; member of the American Medical Association; died November 21, aged 70, of coronary thrombosis.

Hugh Monroe Magee ✠ Syracuse, N. Y.; Syracuse University College of Medicine, 1908; on the staff of the Crouse-Irving Hospital, where he died November 19, aged 67, of thrombosis.

Charles Reuben McCreery ✠ Tacoma, Wash.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1902; member of the North Pacific Surgical Association; fellow of the American College of Surgeons; attending surgeon, Tacoma General and St. Joseph's hospitals; died suddenly, November 14, aged 70, of coronary thrombosis.

James Kearney Miller, Sonora, Texas; University of Nashville (Tenn.) Medical Department, 1905; served during World War I; died in the Veterans Administration Facility, Legion, November 10, aged 66, of chronic pulmonary tuberculosis and tuberculosis of the larynx.

Lewis Emory Missimore, St. Louis; St. Louis University School of Medicine, 1904; served overseas during World War I; resident physician on the staff of the Christian Hospital; died November 9, aged 67, of heart disease.

Harland Addison Nichols, Miami, Ariz. (licensed in Texas under Act of 1907, in New Mexico in 1901 and Arizona in 1906); died September 5, aged 81.

Frederick Phillip Parker ✠ St. Louis; Marion-Sims College of Medicine, St. Louis, 1893; died November 18, aged 75, of coronary thrombosis.

George M. Pate, Rowland, N. C.; Medical College of the State of South Carolina, Charleston, 1900; formerly bank president; died in Lumberton November 13, aged 67, of pneumonia.

Albert Victor Pettit ✠ San Francisco; Stanford University School of Medicine, San Francisco, 1919; associate clinical professor of obstetrics and gynecology and acting executive of the department at his alma mater; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member of the Pacific Coast Society of Obstetrics and Gynecology; since 1929 visiting obstetrician and gynecologist at the San Francisco Hospital; died November 19, aged 53, of coronary occlusion.

Frank E. Plummer, Dayton, Ohio; Baltimore Medical College, 1895; died November 15, aged 76, of cerebral hemorrhage.

Ward Hughes Powell ✠ Minden, Neb.; University of Nebraska College of Medicine, Omaha, 1913; mayor of Minden; county medical adviser; died in the Clarkson Memorial Hospital, Omaha, November 13, aged 62, of coronary occlusion.

Percy Hartley Rushton, Providence, R. I.; Jefferson Medical College of Philadelphia, 1908; member of the staffs of the Homeopathic and Miriam hospitals; died November 18, aged 58, of hypertensive heart disease.

Albert Clifton Sellery ✠ Long Beach, Calif.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1904; fellow of the American College of Surgeons; one of the organizers of the old Long Beach Medical Society, now the Harbor Branch of the Los Angeles County Medical Association; served as president of the board of directors of Seaside Memorial Hospital for six years; died November 23, aged 69.

Hermann K. Stockwell, Salem, Ore.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1902; served overseas with the Canadian Army during World War I; one of the founders of the Salem Clinic; on the staffs of the Salem General and Deaconess hospitals; died November 17, aged 64, of carcinoma of the liver.

Rose Winkler, Azusa, Calif.; Dunham Medical College, Chicago, 1898; died October 25, aged 81, of chronic myocarditis and pernicious anemia.

DIED WHILE IN MILITARY SERVICE

Hugh Grant Cramer, Campbell, Calif.; Stanford University School of Medicine, San Francisco, 1943; served an internship at the Santa Clara County Hospital, San Jose, and a residency at the Monterey County Hospital, Salinas; commissioned a first lieutenant in the medical corps, Army of the United States, on July 17, 1942; died near Pasadena Nov. 11, 1944, aged 28, in an aircraft accident.

Paul Drews Garvin, Boulder, Colo.; University of Colorado School of Medicine, Denver, 1926; member of the American Medical Association; served an internship at the St. Anthony's Hospital in Denver; formerly an intern and resident physician at the Children's Hospital, Denver; at one time assistant professor of clinical pathology at his alma mater; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on Dec. 13, 1940; began active duty in the Army of the United States on March 21, 1941; later promoted to captain and major; died in East Boston, Mass., November 24, 1944, aged 40, of coronary arteriosclerosis.

Herbert Robert Gore ✠ Rochester, Minn.; Long Island College of Medicine, Brooklyn, 1933; interned at the Kings County Hospital in Brooklyn; commissioned a first lieutenant in the medical corps, Army of the United States, on Jan. 9, 1943; began active duty on Feb. 7, 1943; later promoted to captain; died in the Central Pacific area July 26, 1944, aged 36, in an airplane crash.

Lewis Cowan Ramsay ✠ Memphis, Tenn.; University of Tennessee College of Medicine, Memphis, 1936; formerly an intern at the Los Angeles County Hospital in Los Angeles and served a residency in medicine at the Baptist Memorial Hospital; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on Sept. 26, 1938; began active duty in the Army of the United States on March 10, 1941; later promoted to captain and major; killed in an airplane accident in Hanford, Calif., Nov. 4, 1944, aged 34.

Seaton Sailer, Cincinnati; Long Island College of Medicine, Brooklyn, 1931; served an internship at the Roosevelt Hospital in New York and a residency in pathology at St. Luke's Hospital in New York; formerly assistant professor of pathology at the University of Cincinnati College of Medicine; at one time taught in the pathology department at the Medical College of the State of South Carolina, Charleston; member of the American Association of Pathologists and Bacteriologists; on the staff of the Cincinnati General Hospital; commissioned a major in the medical corps, Army of the United States, on Feb. 19, 1942; began active duty in June 1942; later promoted to lieutenant colonel; in charge of pathologic work at the Twenty-Fifth General Hospital in France; died in France Nov. 24, 1944, aged 39, of head injuries, shock and internal injuries accidentally incurred when struck by a truck along a highway.

Donald Meyers Ward ✠ Colonel, M. C., U. S. Army, North Little Rock, Ark.; University of Colorado School of Medicine, Denver, 1933; interned at the Mercy Hospital, Denver; appointed a first lieutenant in the medical reserve corps of the U. S. Army on June 15, 1934; entered the medical corps of the U. S. Army in December 1934; later promoted to captain, major, lieutenant colonel and colonel; died in Guadalcanal Nov. 20, 1944, aged 38.

Rowland Daniel Wolfe ✠ Lieutenant Colonel, U. S. Army, retired, Columbus, Ohio; George Washington University School of Medicine, Washington, D. C., 1908; Army Medical School, 1917; served with the American Expeditionary Forces during World War I; fellow of the American College of Surgeons; at one time superintendent of the Norfolk Protestant Hospital, Norfolk, Va.; entered the medical corps of the U. S. Army as a first lieutenant on Aug. 21, 1917; later promoted to captain, major and lieutenant colonel; retired from active duty on Feb. 28, 1939; recalled to active duty on Sept. 11, 1940; assigned to senior instructor in the ROTC Medical Unit at Ohio State University, where he served as assistant professor of military science; when the army special training program was established in June 1943 he was appointed commanding officer of the medical battalion; died in the Fletcher General Hospital, Cambridge, Sept. 28, 1944, aged 58, of thrombosis of the coronary artery.

Correspondence

THE RH BLOOD FACTORS

To the Editor:—In the course of the recent rapid developments in the field of the Rh blood factors it has become necessary to invent a special vocabulary to express the new ideas and describe the new facts which have been discovered. This vocabulary has been tested by actual usage and has the approval of other workers to whom it was sent for their opinions. My purpose in this communication is to publicize the vocabulary more widely for the sake of uniformity in the use of nomenclature by all interested in the subject.

A. S. WIENER, M.D., Brooklyn.

Anti-rhesus serums. Immune serums prepared in rabbits, guinea pigs, goats and other animals by injecting them with the blood of rhesus monkeys. The term applies to serums like the original experimental serums of Landsteiner and Wiener, which agglutinate the bloods of 85 per cent of all white persons.

Anti-Rh$_o$ human serums. Human serums (usually obtained from mothers of erythroblastic infants) which gave reactions paralleling the anti-rhesus serums; also known as standard anti-Rh serums.

Rh testing. Examination of blood for the Rh factor, using either anti-rhesus serum or anti-Rh$_o$ serum alone.

Rh reaction. Result of the Rh test, namely either Rh positive or Rh negative. When the terms Rh negative and Rh positive are used as adjectives, they should be hyphenated; e. g. Rh-positive blood; Rh-negative individuals; but "the blood is Rh positive."

Rh sensitization. The act of becoming sensitive to the Rh factor. This may occur in one of two ways; namely, as a result of a transfusion of Rh-positive blood or as the result of pregnancy with an Rh-positive fetus. Natural sensitivity to the Rh factor does not occur; and only 1 in 25 to 50 Rh-negative persons exposed to the Rh antigen by transfusion or pregnancy becomes sensitized.

Rh factors are three in number, designated as Rh$_o$, Rh' and Rh" respectively.

Rh agglutinins. The animal anti-rhesus agglutinins are all of the same specificity (85 per cent positive on white persons). The anti-Rh agglutinins of human serums have three different specificities corresponding to the three Rh factors, namely anti-Rh$_o$ (85 per cent positive on white persons), anti-Rh' (70 per cent positive) and anti-Rh" (30 per cent positive).

Rh agglutinogens; Rh antigens. These are five in number: Rh$_1$ (or Rh$_o$'), Rh$_2$ (or Rh$_o$"), Rh', Rh" and Rh$_o$.

Rh antiserums. Antiserums reacting with one or more of the Rh factors. Among human beings, in addition to serums containing only one sort of Rh agglutinin there are some with two Rh agglutinins. Five common varieties of human Rh antiserums are anti-Rh$_o$, anti-Rh', anti-Rh", anti-Rh$_o$' (containing two agglutinins, anti-Rh$_o$ and anti-Rh') and anti-Rh$_o$".

Rh genes. The series of allelic genes which determine the various sorts of Rh agglutinogens and Rh blood types. The most common (the standard) genes are six in number: *rh, Rh', Rh", Rh$_o$, Rh$_1$* and *Rh$_2$*. When discussing only the results of tests with the standard anti-Rh$_o$ serums, dividing persons into two types, Rh positive and Rh negative, only a pair of genes need be considered, *Rh* and *rh*. Obviously, Rh-positive persons may be either homozygous (genotype *RhRh*) or heterozygous (*Rhrh*), while Rh-negative persons are always homozygous (*rhrh*).

Rh blood types. Tests with anti-Rh$_o$, anti-Rh' and anti-Rh" yield eight standard types. The names of these types and their approximate frequencies among white persons in New York City are as follows: type Rh$_1$Rh$_2$, 13 per cent; Rh$_1$, 54.5 per cent; Rh$_2$, 15 per cent; Rh$_o$, 2.5 per cent; Rh'Rh", 1 in about 10,000; Rh', 1.2 per cent; Rh", 0.3 per cent, and Rh-, 13.5 per cent. There are striking differences in the distribution among different races; for example, in Negroes type Rh$_o$ exceeds 40 per cent; in Mongolian races Rh- is virtually absent, and so on.

Rh typing. Classification of individuals within one of the eight Rh types with the aid of anti-Rh$_o$, anti-Rh' and anti-Rh" serums. Note the distinction between "Rh typing" and "Rh testing."

Rh genotypes. The six standard genes pair to yield twenty-one different genotypes. These twenty-one genotypes in turn fall into eight phenotypes identical with the eight Rh blood types, because only eight distinct types of blood can be distinguished with the anti-Rh$_o$, anti-Rh' and anti-Rh" serums.

Rh classes. For convenience in analyzing genetic results, the classification of persons according to their reactions only with anti-Rh' and anti-Rh" is convenient. This yields four classes, W, U, V and UV, analogous to the four common blood groups. Each class includes a pair of Rh types as follows: class W, Rh$_o$ and Rh-; class U, types Rh$_1$ and Rh'; class V, types Rh" and Rh$_2$; class UV, types Rh'Rh" and Rh$_1$Rh$_2$.

Hr factor. The factor present in the agglutinogens determined by genes *rh, Rh$_o$, Rh"* and *Rh$_2$*. Hence only persons belonging to type Rh$_1$ (provided they belong to genotype *Rh$_1$Rh$_1$* or *Rh$_1$Rh'*) or type Rh' (rare genotype *Rh'Rh'*) can possibly be Hr negative. Persons belonging to any of the other six Rh blood types are uniformly Hr positive. The common idea that infants with hemolytic disease due to the Hr factor are always Rh negative is wrong; such infants must in fact always be Rh positive.

Anti-Hr serum. Serum capable of reacting with blood containing the Hr factor.

Hr tests. Tests with anti-Hr serum.

Hr reaction. Results of the Hr tests, namely either Hr positive or Hr negative.

Rh incompatibility. Incompatibility based on difference with respect to one or more of the Rh factors.

Hr incompatibility. Incompatibility with respect to the Hr factor.

Rh blocking serum (antibody). A serum capable of reacting with blood containing the Rh factor but without producing agglutination, though blocking the action of subsequently added anti-Rh serums; i. e., Rh-positive blood treated with Rh blocking serum can no longer be agglutinated by anti-Rh serum. To date, blocking antibodies of only one specificity have been found, namely, anti-Rh$_o$.

FOUR GENERATIONS OF SACROILIAC ARTHRITIS

To the Editor:—In reference to the editorial comment on four generations of sacroiliac arthritis (THE JOURNAL, Aug. 12, 1944, p. 1044), I am sorry I am stationed outside the continental limits and do not have access to the original article, but the comment must have caused most orthopedic surgeons either to laugh or to have apoplexy.

Is pain in the region of the sacroiliac joint diagnostic of sacroiliac arthritis? Does the presence of sciatica and tingling and swelling of the extremities make it more so?

Were any x-ray studies made in this group of remarkable people, who were for the most part manual laborers and obese? Is not anatomic structure of the lumbar spine also hereditary?

Why do people with obvious arthritis have so few sacroiliac symptoms? Does not the sacroiliac joint fuse early and spontaneously in most cases of true arthritis?

Why go on? If the original article answered these questions you didn't give it justice in your comment. If it did not it does not merit other than condemnation in a supposedly scientific publication.

An analogous set of questions could be asked about the article in the issue of Jan. 29, 1944, page 269.

The idea that the sacroiliac joint is responsible for most pains in the back is one of the most persistent in medicine, and its perpetuation is given frequent stimulus even by some orthopedic surgeons.

It is impossible for me to understand why every one looks first at a joint having approximately the surface area of the palm of the hand and having little if any mobility, when there is a much more mobile and mechanically overloaded joint immediately above it which has the approximate area of the thumb nail.

DUNCAN C. MCKEEVER, Commander (MC), U.S.N.R.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Misrepresentation by Physicians Employed by Defendant Concerning Extent of Injuries as Tolling Statute of Limitations.—While a passenger in one of the defendant's street cars in 1930 the plaintiff was injured by glass splinters piercing his right eyeball, allegedly because of the negligence of agents of the defendant. Acting in accordance with the directions of the defendant, the plaintiff went to "certain eye specialists" employed by the defendant and submitted to treatment by them at the defendant's expense. The physicians removed the splinters of glass from the eyeball and told him that the eye wounds would heal quickly and that he would "have no further trouble." They instructed him to go to no other physician but to return to them in two years for a final check-up. The plaintiff followed those directions, and when he returned two years later he was advised by them that, aside from the need for glasses, his injured eye was cured and in "perfect condition." In October 1942 the plaintiff perceived for the first time that the vision of his right eye was blurred, and when he consulted another physician in February 1943 it was discovered "that, due to the severance of the cellular system and delicate tissues of the eyeball which occurred at the time of the accident in 1930, and as a proximate result of the injury thereby received, a cataract had completely enveloped the eye and he was totally and permanently blind in the right eye." Notwithstanding the fact that the California statute provides a one year period of limitation for the commencement of an action for an injury resulting from the wrongful act or neglect of another, the plaintiff instituted action against the defendant in June 1943, alleging a causal relation between the negligence of the agents of the defendant in 1930 and in his loss of sight that followed in 1943. He contended that the applicable one year statute of limitation did not apply because the physicians employed by the defendant fraudulently concealed from him the nature of his injuries and that therefore the statute should not begin to run until he had ascertained his injuries. The trial court sustained a demurrer interposed by the defendant based, in effect, on the assumption that the statute of limitations precluded the maintenance of an action by the plaintiff, and the plaintiff eventually appealed to the Supreme Court of California.

In resolving the question of the correctness of the trial court's order, said the Supreme Court, the legislative policy in prescribing a period of limitation for the commencement of actions must be borne in mind. "The statute of limitations is a statute of repose, enacted as a matter of public policy to fix a limit within which an action must be brought, or the obligation is presumed to have been paid, and is intended to run against those who are neglectful of their rights, and who fail to use reasonable and proper diligence in the enforcement thereof. . . . These statutes are declared to be 'among the most beneficial to be found in our books,' 'They rest upon sound policy, and tend to the peace and welfare of society'; . . . The underlying purpose of statutes of limitation is to prevent the unexpected enforcement of stale claims concerning which persons interested have been thrown off their guard by want of prosecution." 1 Wood, Limitations, pp. 8, 9. However, it is provided by statute in this state that when the liability accrues by reason of fraud, the statute will not run until the fraud is discovered. Code Civ. Proc. sec. 338, subd. 4. Similarly, the courts of this state have held that when the defendant is guilty of fraudulent concealment of the cause of action the statute is deemed not to become operative until the aggrieved party discovers the existence of the cause of action. See Dawson, Undiscovered Fraud and Statutes of Limitation, 31 Mich. L. Rev. 591, at p. 593, notes, and Fraudulent Concealment and Statutes of Limitation, id. 875 at 877. In *Kane* v. *Cook*, 8 Cal. 449, for instance, it was held "that in all cases a fraudulent concealment of the fact, upon the existence of which the cause of action accrues, is a good answer to the plea of the Statute of Limitations."

The defendant contended that when a personal injury results from the wrongful act or neglect of another the cause of action accrues when the breach of duty occurred, and the statute then commences to run, on the theory that since the breach of duty of care and consequent impact followed by injury cannot be concealed, the fraud alleged to have been committed by the defendant cannot result in concealment of the cause of action, and therefore there is no fraudulent concealment within the meaning of the decisions previously referred to. But, answered the court, the plaintiff's right to relief in such cases is not dependent on technical legal definitions. In reality the ground of relief is that the defendant, having by fraud or deceit concealed material facts and by misrepresentations hindered the plaintiff from bringing an action within the statutory period, is estopped from taking advantage of his own wrong. The statute of limitations was intended as a shield for protection against stale claims, but a defendant may not use it to perpetrate a fraud on otherwise diligent suitors. Technical rules as to when a cause of action accrues apply therefore only in those cases which are free from fraud committed by the defendant. Section 338, subdivision 4, Code of Civil Procedure, recognizes the nonapplicability of those technical rules where the fraud of the defendant may be so concealed that, in the absence of circumstances imposing greater diligence on the plaintiff, the cause of action is deemed not to accrue until the fraud is discovered. Otherwise, in such cases, the defendant, by concealing his fraud, would effectively block recovery by the plaintiff because of the intervention of the statute of limitations. The same conclusion governs when the defendant under duty of disclosure has concealed known essential facts on which to base a recovery against him and thereby has hindered the plaintiff from bringing his action until after the statute would otherwise have terminated the period of limitation. We are not here called on to determine what acts of concealment might under the circumstances be deemed a legitimate hindrance to litigation. Whether in itself it is an actionable fraud or merely suffices to toll the statute on the original obligation, the breach of a duty to disclose known facts with the intention to and which does hinder commencement of an action until the action would be outlawed is a fraud practiced on the plaintiff which in conscience estops the defendant's reliance on the statute of limitations. The cases relied on by the defendant wherein it has been stated that the cause of action accrues at the time of the injury, and that the late discovery of the person responsible therefor or of the extent of the injury does not postpone the commencement of the statutory period, have heretofore been distinguished by this court as cases where fraud and deceit were not involved.

The defendant relied on two cases in particular as support for its position that fraudulent concealment of the extent of the injury cannot amount to fraudulent concealment of facts giving rise to the cause of action. In one, *Maloney* v. *Brackett*, 275 Mass. 479, 176 N. E. 604, the plaintiff sued two physicians for malpractice, alleging fraudulent concealment as excuse for late filing, and the trial court entered judgment on directed verdicts for the defendants. In overruling the plaintiff's exceptions, it was held that the failure of a doctor to disclose a cause of action to a patient could not be found to be a breach of his professional duty without evidence that he knew or believed that a cause of action existed; that there was no evidence that either the defendant knew or believed that he had performed or assisted in the performance of an unnecessary operation, and that the prediction as to the plaintiff's recovery made before the operation had no tendency to prove that they did not in good faith consider the operation advisable. In the other, *Ogg* v. *Robb*, 181 Iowa 145, 162 N. W. 217, L. R. A. 1918C, 981, the plaintiff was burned by x-ray treatments administered by the defendant in 1901. The burnt area did not heal but became malignant. In 1915 the plaintiff sued, alleging malpractice and fraudulent concealment by misrepresentations of the temporary character of the burn. A demurrer to the complaint was sus-

tained. In holding that the statute of limitations was not suspended, the court attributed the representation of the defendant regarding the nature of the burn as an expression of opinion only. The statement of the facts considered in those cases, said the court, makes them readily distinguishable from the proposition contended for the plaintiffs. To the contrary of defendant's contention the following malpractice cases held that fraudulent concealment would foreclose the defense of the statute of limitations: *Groendal* v. *Westrate*, 171 Mich. 92, 137 N. W. 87, Ann Cas. 1914B, 906; *Schmucking* v. *Mayo*, 183 Minn. 37, 235 N. W. 633. In the Schmucking case it was said that in the presence of a fiduciary and confidential relation the fraud may more readily be perpetrated, designating that of physician and patient as such relationship, citing *Groendal* v. *Westrate*, supra, and that it was well to bear in mind that the statute does not run against actions for fraud until the fraud is discovered. It was also said:

". . . a person should not be permitted to shield himself behind the statute of limitations where his own fraud has placed him. He should not be permitted to profit by his own wrong, and it would strike the moral sense strangely to permit him to do so. We are not aware of any principle of law or equity which affords immunity to a fraudulent defendant who by his deceitful practice induces a creditor to forbear his efforts to collect his debt until after it has become barred by the lapse of time."

The confidence, continued the court, growing out of the relationship of physician and patient imposes on a physician the duty of refraining from fraudulent concealment, that is, the duty of disclosure when he has knowledge of the facts. If that is the result in malpractice cases, then all the more was the defendant herein under a duty of disclosure when it voluntarily undertook to treat the plaintiff's injuries caused by its own breach of duty. Where there is a duty to disclose, the disclosure must be full and complete, and any material concealment or misrepresentation will amount to fraud sufficient to entitle the partly injured thereby to an action. *Kimball* v. *Pacific Gas & Elec. Co.*, 220 Cal. 203, 30 P. (2d) 39; *Vance* v. *Supreme Lodge*, 15 Cal. App. 178, 114 P. 83. Since its voluntary undertaking placed on the defendant the duty to disclose to the plaintiff the full extent of his injuries and the probable future disability to be expected therefrom, its false representation designed to conceal facts known to it and intended to prevent plaintiff's consulting other physicians, and thus hinder him from bringing action until after the running of the statutory period of limitations, must be deemed to amount to fraud on the plaintiff and to excuse any greater diligence on his part under the facts disclosed by the complaint. No fact as to the plaintiff's condition is alleged which could be deemed to have put him on earlier notice.

The only remaining question, said the court, is whether the defendant was bound by the alleged deceit and misrepresentations of its agents, the physicians it employed to care for the plaintiff. The agents' alleged deceit was not intended for their own benefit but for the pecuniary advantage of the defendant, their principal. If its agents' deceit should succeed, the defendant would reap the pecuniary gain therefrom. Thus its agents have employed the alleged deceit for the sole benefit of the defendant, and in such a case the facts must be deemed to be within the defendant's knowledge. The same principles therefore apply to make it unconscionable for the defendant to rely on the bar of the statute. As was said in *Lightner Mining Co.* v. *Lane*, 161 Cal. 689, 120 P. 771, Ann. Cas 1913C, 1093, the fraud of the agents will be imputed to the principal for the purpose of preventing the running of the statute of limitations whether the principal was aware of it or not. The injustice of allowing such fraud to become successful by reason of lapse of time and concealment is an injustice to the plaintiff, and it is precisely the same in effect and extent whether the fraud is that of the defendant or its agents. The defendant, having received the benefit of its agents' fraud, has no equity in its favor.

The court accordingly concluded that the plaintiff had timely instituted the action against the defendant after his discovery of the fraud alleged and that the trial court erred in sustaining the defendant's demurrer. The judgment in favor of the defendant company was accordingly reversed.—*Pashley* v. *Pacific Electric Co., 153 P. (2d) 325 (Calif., 1944).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, January 27, page 244.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 26-28. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, March. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARKANSAS: * *Eclectic.* Little Rock, June 7. Sec., Dr. C. H. Young, 1415 Main St., Little Rock. *Medical.* Little Rock, June 7-8. Sec., Dr. D. L. Owens, 701 Main St., Little Rock.

CALIFORNIA: *Oral.* Los Angeles, March 3. *Written.* Los Angeles, Feb. 27-March 2. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

COLORADO: * Denver, April 3-6. Final date for filing application is March 19. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: * *Homeopathic.* Derby, March 12-13. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven. *Medical. Examination.* March 13-14. *Endorsement.* March 27. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE: *Examination.* Dover, July 10-12. *Reciprocity.* Dover, July 17. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * *Reciprocity.* Washington, March 12. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington 1.

FLORIDA: * Jacksonville, June 25-26. Sec., Dr. Harold D. Van Schaick, 2736 S. W. Seventh Ave., Miami 36.

ILLINOIS: Chicago, April 3-5. Superintendent of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

KANSAS: Topeka, Feb. 19-20. Sec., Board of Medical Registration and Examination, 905 N. Seventh St., Kansas City 10.

KENTUCKY: Louisville, June 18-20. Sec., State Board of Health, Dr. Philip E. Blackerby, 620 S. Third St., Louisville 2.

MAINE: Portland, March 13-14. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MARYLAND: Baltimore, June 19-22. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore.

MASSACHUSETTS: Boston, March 13-16. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MISSISSIPPI: Jackson, Feb. 9. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MONTANA: Helena, April 2-4. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEVADA: *Endorsement.* Carson City, Feb. 5. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 8-9. Sec., Board of Registration in Medicine, Dr. D. G. Smith, 77 Main St., Nashua.

NEW JERSEY: Trenton, June 19-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 9-10. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NORTH CAROLINA: *Reciprocity.* Raleigh, Feb. 5. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, July 3. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, April. Columbus, June. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, June 14-16. Sec., Dr. J. D. Osborn, Jr., Frederick.

PENNSYLVANIA: April 10-13. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. M. G. Steiner, 358 Education Bldg., Harrisburg.

RHODE ISLAND: * Providence, April 5-6. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 25-27. Sec., Dr. N. B. Heyward, 1329 Blandina St., Columbia.

VERMONT: Burlington, June. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: * Richmond, June 20-23. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WEST VIRGINIA: Charleston, Feb. 26-28. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

WISCONSIN: * Milwaukee, June 26-28. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, Feb. 5-6. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT: Feb. 10. Address State Board of Healing Arts, 250 Church St., New Haven 10.

DISTRICT OF COLUMBIA: Washington, April 23-24. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington 1.

FLORIDA: DeLand, June 1. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

IOWA: Des Moines, April 10. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, May 11-12. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

MINNESOTA: Minneapolis, April 3-4. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis 14.

NEBRASKA: Omaha, May 1-2. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

NEW MEXICO: Santa Fe, Feb. 12. Sec., Miss Marion M. Rhea, State Capitol, Santa Fe.

OKLAHOMA: Oklahoma City, April 9. Sec., Dr. J. D. Osborn, Jr., Frederick.

OREGON: Portland, March 3. Sec., Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Feb. 14. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Yankton, June 19. Sec., Dr. G. M. Evans, Yankton.

TENNESSEE: Memphis, March 27-28. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Hygiene, Baltimore

40:227-346 (Nov.) 1944

Occurrence of Some Unusual Salmonella Types in Man, Including a New Type. E. Seligmann, I. Saphra and M. Wassermann.—p. 227.
Studies on Staphylococci: III. Further Observations on Bacteriophage Typing of Staphylococcus Aureus. R. T. Fisk and Olga E. Mordvin. —p. 232.
Effect of Temperature, Humidity and Glycol Vapor on Viability of Air Borne Bacteria. K. B. DeOme and Personnel of U. S. Navy Medical Research Unit No. 1.—p. 239.
Investigations on Mosquito Transmission of Plasmodium Lophurae Coggeshall 1938. G. M. Jeffery.—p. 251.
Avian Salmonellosis: Types of Salmonella Isolated and Their Relation to Public Health. W. R. Hinshaw, E. McNeil and T. J. Taylor.—p. 264.
*Seasonal Patterns of Measles and Chickenpox. Mildred Weeks Wells. —p. 279.
Dynamics of Meningococcal Infections and Effect of Chemotherapy. J. J. Phair and E. B. Shoenbach.—p. 318.

Seasonal Patterns of Measles and Chickenpox.—Weeks Wells asserts that the rate of spread of an air borne infection is proportionate not only to the concentration of persons susceptible to it but also to the concentration of the causative micro-organisms in the varied atmospheres which they breathe. Rate of spread refers to the number of cases arising on the average from each previous case per unit of time corresponding to the incubation period. The concentration of micro-organisms in an enclosed inhabited atmosphere is an equilibrium between rate of addition (proportionate to the number of infective persons) and their specific infectivity—stage of disease, coincidence of a cold and so on—and rate of elimination, determined by ventilation. Epidemiologists have long been interested in the relation which the concentration of the susceptible in a population bears to the rate of spread of an epidemic disease, and it is now recognized that the "cyclical or intrinsic periodicities" is a function of the concentration of the susceptible. If a disease is air borne, certain consequences as to its seasonal patterns necessarily follows: 1. Since the rate of spread of the disease is proportionate to the concentration of the causative micro-organisms in inhabited atmospheres and since this concentration depends on ventilation, it follows that (*a*) in those localities where there is considerable difference between summer and winter temperatures, incidence of the infection will likewise show a pronounced sensitivity to seasonal change: that is, the ratio between maximum and minimum numbers of cases for given fractions of the year will be high; (*b*) seasonal patterns will vary with climate, since this affects the length of the season when ventilation is impeded by closed windows. 2. Since the rate of spread is proportionate to concentration of the susceptible, (*a*) seasonal patterns will vary in years of high and low incidence and (*b*) seasonal patterns will vary in urban and rural communities. The seasonal patterns of spread of measles and chickenpox, while differing greatly from each other, are both entirely compatible with the theory of transmission by air borne droplet nuclei. This does not prove the validity of the theory. Such proof can come only with the accumulation of evidence from many fields or from the successful control of respiratory diseases by air purification. The seasonal patterns of scarlet fever, on the other hand, suggest that means of transmission less amenable to control by ventilation than are droplet nuclei assume an important role in its spread.

American Journal of Surgery, New York

66:148-286 (Nov.) 1944

Place of Surgery in Fibroids of Uterus. C. W. Barrett.—p. 148.
*Hydrocele: Its Relationship to Hernia. C. R. O'Crowley and J. Herzlich. —p. 157.
Abdominal Pregnancy: Survey of Literature and Report of Unusual Case. A. R. Gardner and G. Middlebrook.—p. 161.
Mesenteric Vascular Occlusion: Presentation of 15 Cases. B. J. Ficarra. —p. 168.
Intravenous Anesthesia in Major Surgery: Use of One Per Cent Solution of Pentothal Sodium. J. K. Narat and E. Giraldi.—p. 178.
Modern Fracture Deformity Reducing Splints. H. C. Masland.—p. 182.
Subphrenic Abscess, with Special Reference to Intrathoracic Complications. O. T. Clagett and W. S. Tinney.—p. 189.
Plastic Reconstruction of Acquired Defects of Ear, with Case Reports. A. J. Suraci.—p. 196.
Gallbladder Surgery: Five Year Survey. M. Burghardt.—p. 203.
Perirenal Insufflation. F. L. Senger and J. J. Bottone.—p. 213.
Total Disruption of Surgical Wounds of Abdominal Wall, with Reference to Plasma Proteinemia and Plasma Ascorbic Acid. W. G. Kraybill. —p. 220.
Empyema of Lung: Review of Literature and Analysis of 169 Cases. P. J. Shank.—p. 224.
Effects of Sulfanilamide Locally Implanted in Clean Wounds. J. L. Southworth.—p. 245.
Improved Technic for Preparing Buried Dermal Graft in Hernial Repair. J. V. Scola.—p. 249.

Relationship Between Hydrocele and Hernia.—O'Crowley and Herzlich classify hydroceles into those of the testis, those of the cord and complications of these forms. They found 7 hernias in a series of 20 cases treated surgically. The literature gives the impression that this association is infrequent. Of the 20 cases of surgically treated hydrocele 3 involved congenital hydroceles all associated with hernia and 1 of these with an undescended testis; the rest were of the ordinary type. In all cases of hernia either intestinal or omental tissue was present in the sac; it was in the congenital hydrocele sac or in a separate pouch alongside the cord. All hernias were of the indirect variety. Of the 20 cases, only 1 hernial hydrocele and 3 uncomplicated hydroceles were on the left side. Most were diagnosed at operation, because frequently the hernia could not be discovered with certainty until then. Those communicating directly with the peritoneal cavity could not be diagnosed on examination unless the hernia was fairly large. The authors stress the frequency of association of hydrocele and hernia in the ages between 19 and 30. They recommend the inguinal approach for the repair of hydrocele in view of the possibility of an associated hernia.

Canadian Medical Association Journal, Montreal

51:397-492 (Nov.) 1944

Sources and Modes of Venereal Disease Infection in the Royal Canadian Air Force. J. W. Tice.—p. 397.
Ultraviolet Radiation in Surgery. R. Fraser.—p. 403.
Anesthesia as Practiced on Active Service in the Navy. C. C. Stoddard. —p. 409.
Causes of Rejection from Army and Incidence of Defects in Recruits. F. S. Park.—p. 412.
Management and Prevention of Rheumatic Fever. R. R. Struthers. —p. 416.
Thiouracil in Treatment of Thyrotoxicosis. E. Lozinski and J. Simirovitch.—p. 422.
Pancreatic Necrosis in Ethyl Alcohol, Methyl Alcohol and Arsenic Poisoning. A. Branch.—p. 428.
Fractures of the Wrist and Hand. H. S. Morton.—p. 430.
Nonmalignant Duodenocolonic Fistula. J. B. McClinton.—p. 434.
Wilson's Disease. R. Altschul and J. S. Brown.—p. 436.
Scope of Industrial Medicine and Hygiene. J. G. Cunningham.—p. 439.
*Estrogenic Origin of Uterine Fibromyomas. E. Shute.—p. 443.
Toxic Hepatitis in Fever Therapy. R. M. MacDonald.—p. 445.
Value of Electrocardiogram in Diagnosis of Heart Disease. L. T. Williamson.—p. 450.
Primary Malignant Tumors of Small Bowel. R. F. Warren.—p. 451.
Tuberculous Lesions of Other Organs Concurrent with Renal Tuberculosis. K. F. Davis.—p. 457.

Estrogenic Origin of Uterine Fibromyomas.—Shute analyzed the histories of 130 consecutive unselected women with fibromyomas for evidence of old functional menorrhagias or hypothyroid states. Fifty-two per cent of these gave a history of menorrhagia, probably functional, in the second decade. Sixty-three per cent of them were hypothyroid. The author was impressed by the sequence of functional menorrhagia in the

early decades, ending in organic menorrhagia in later decades. Furthermore, menorrhagia that seemed to be due to fibroid tumors in many instances quickly responded to treatment with antiestrogen such as thyroid or testosterone propionate. It is hoped that the gynecologist of the future will not be satisfied with the mere diagnosis and extirpation of fibromyomas. He will hope to recognize them early and prevent their growth and interference with function, or, better still, he will hope to recognize in the first two decades of life those women who are apt to develop fibroids later and take preventive measures accordingly.

Endocrinology, Springfield, Ill.

35:283-408 (Nov.) 1944

Absorption of Subcutaneously Implanted Hormone Pellets. M. B. Shimkin, E. Lorenz, Rose Wyman and Sue Gray Norton.—p. 283.
Effect of Thyroxin Injections on the Thyrotrophin Content of Anterior Pituitary of Male Albino Mouse. A. Elizabeth Adams and Dorothy Jensen.—p. 296.
Effect of Testosterone Propionate on Body Weight and Skeletal System of Hypophysectomized Rats: Synergism with Pituitary Growth Hormone. Miriam E. Simpson, W. Marx, H. Becks and H. M. Evans.—p. 309.
Estrous Rabbit as Quantitative Assay Animal. J. T. Bradbury.—p. 317.
Chemical Studies on Melanogenesis in Normal and Adrenalectomized Rats. H. J. Spoor and Elaine P. Ralli.—p. 325.
Anterior Pituitary and Its Relation to Adrenal Cortex in Water Diuresis. S. Joseph, Malvina Schweizer, Naomi Z. Ulmer and R. Gaunt.—p. 338.
Immune Reactions in Rabbits and Rats After Injections of Thyroid Globulin. A. E. Meyer, Constance M. Stickney, D. Marine and J. Letman.—p. 347.
Relation Between Light-Dark Rhythms and Hour of Lay of Eggs Experimentally Retained in Hen. I. Rothchild and R. M. Fraps.—p. 355.
Effect of Various Gonadotropic Hormone Preparations on Blood Plasma Ascorbic Acid of Sheep and Rabbits. H. A. Lardy, L. E. Casida and P. H. Phillip.—p. 363.
Effect of Insulin on Urinary Excretion of Sodium, Chloride, Nitrogen and Glucose in Normal Rats. D. J. Ingle, J. S. Evans and Ruth Sheppard.—p. 370.
Iodine in Blood and Thyroid of Man and Small Animals. W. T. Salter and Elizabeth A. McKay.—p. 380.

Journal-Lancet, Minneapolis

64:325-360 (Oct.) 1944

Brucellosis (Undulant Fever). N. W. Stewart.—p. 344.
Infertility and Sterility: Six Year Study. C. M. McLane.—p. 346.
Is Vaccine Therapy of Value in Allergies of Children? A. V. Stoesser.—p. 351.

64:361-388 (Nov.) 1944

Middle Ear Disease in Children. L. R. Boies.—p. 361.
Medication in Common Eye Diseases. E. D. Perrin.—p. 365.
Vegetable Foreign Bodies in Tracheobronchial Tree. P. G. Bunker.—p. 369.
Management of Strabismus in Children. A. D. Prangen.—p. 374.
Eye and Ear Complications in Acute Infectious Diseases. H. Brunner.—p. 375.
Eye Changes in Disease of Thyroid. A. D. Ruedemann.—p. 376.
Retinal Vascular Changes and Retinitis in Hypertension. J. F. Gipner.—p. 380.
Trends in Rhinology. G. A. Larson.—p. 381.
Physical Allergy and Paranasal Sinus Disease. J. E. Andes.—p. 384.

Journal of the Mount Sinai Hospital, New York

11:137-184 (Sept.-Oct.) 1944

Some Recent Advances in Bacteriology and Virus Research, with Special Reference to Electron Microscopy. G. Shwartzmann.—p. 137.
Ulcerative Colitis. A. Winkelstein.—p. 159.
Pulmonary Embolus of Noncardiac and Nonpostoperative Origin. E. Meilman and S. Davison.—p. 164.
Intracranial Meningiomas. A. Kazan, D. Weller and J. Jaramillo.—p. 169.

Journal of Nat. Cancer Inst., Washington, D. C.

5:77-150 (Oct.) 1944

Research Activities of National Cancer Institute. M. B. Shimkin.—p. 77.
Relationships Between Spontaneous Tumors of Lung and Cutaneous Tumors Induced with Ultraviolet Radiation in Strain A Mice. H. F. Blum.—p. 89.
Histologic Changes in Adrenal Glands of Tumor Bearing Mice. A. J. Dalton.—p. 99.
Sulfur Distribution in Extracts of Normal and Neoplastic Tissues. Jesse P. Greenstein and Florence M. Leuthardt.—p. 111.
Review of Nutritive Requirements of Normal Mice for Growth, Maintenance, Reproduction and Lactation. H. P. Morris—p. 115.
Properties of Mouse Mammary Tumor Agent. H. B. Andervont.—p. 143.

Journal of Pharmacology & Exper. Therap., Baltimore

82:103-202 (Oct.) 1944

Role of Blood Dilution in Aspirin Antipyresis. F. Guerra.—p. 103.
Observations on Analgesic Effect of Morphine During Continued Daily Administration of Small and Uniform Doses to Dogs. F. R. Goetzl, D. Y. Burrill and A. C. Ivy.—p. 110.
Observations Bearing on Mechanism of Elimination of Quinine and Atabrine from Circulation and Tissues. G. Chen and E. M. K. Geiling.—p. 120.
Observations on Effect of Hyperventilation on Reflex Respiratory Stimulating Action of Nicotine and Cyanide. P. S. Larson, E. L. Smith, J. K. Finnegan and H. B. Haag.—p. 133.
Spontaneous Development of Arsenic Resistance in Trypanosoma Equiperdum and Its Mechanism. H. Eagle and H. J. Magnuson.—p. 137.
*Acute and Subacute Toxicity of DDT (2,2,-bis(p-Chlorophenyl)-1,1,1-Trichloroethane) to Laboratory Animals. G. Woodard, A. A. Nelson and H. O. Calvery.—p. 152.
Percutaneous Absorption of DDT (2,2-Bis(p-Chlorophenyl) 1,1,1-Trichloroethane) in Laboratory Animals. J. H. Draize, A. A. Nelson and H. O. Calvery.—p. 159.
Studies on Veratrum Alkaloids: VI. Protoveratrine: Its Comparative Toxicity and Its Circulatory Action. O. Krayer, G. K. Moe and R. Mendez.—p. 167.
Clinical Studies on Digitoxin (Digitaline Nativelle), with Further Observations on Its Use in Single Average Full Dose Method of Digitalization. H. Gold, M. Cattell, W. Modell, N. T. Kwit, M. L. Kramer and W. Zahm.—p. 187.
Isopropyl Alcohol: Rate of Disappearance from Blood Stream of Dogs After Intravenous and Oral Administration. A. J. Lehman, H. Schwerma and Eleanor Rickards.—p. 196.

Toxicity of DDT.—According to Woodard, DDT is quite insoluble in water but soluble in oils and organic solvents. The material used in this investigation was either dissolved in corn oil or used in the dry powdered state. Several species of animals and test methods were used. The authors were especially interested in the differences in susceptibility which were manifested both within and between species. DDT was found to be acutely toxic by mouth to small laboratory animals such as rats, mice, guinea pigs, rabbits and chicks in doses ranging from 150 to 750 mg. per kilogram of body weight. Acute doses may produce anorexia, tremors, depression and death. DDT is capable of causing subacute toxicity when given in small amounts in the diet for periods of from three days to twenty weeks. Definite signs of toxicity are produced by levels in the diet of 0.05 per cent (500 parts per million) for rats and mice, 0.1 per cent for guinea pigs and less than 0.05 per cent for growing chicks. Characteristic of DDT poisoning is the wide variation in individual susceptibility, making the estimate of a safely tolerated dose extremely difficult.

New England Journal of Medicine, Boston

231:609-621 (Nov. 2) 1944

*Penicillin in Sulfonamide Resistant Gonorrhea: Review of 200 Cases. N. S. Scarcello.—p. 609.
Studies in Medical Sociology: III. The Relation of Mental Disorders to Race and Nationality. R. W. Hyde and R. M. Chisholm.—p. 612.
Physical Therapy in Wartime. K. G. Hansson.—p. 619.
Parenteral Fluid Therapy: II. Estimation of Losses Incident to Starvation and Dehydration with Acidosis or Alkalosis and Provision of Repair Therapy. A. M. Butler and N. B. Talbot.—p. 621.

Penicillin in Sulfonamide Resistant Gonorrhea.—Scarcello reviews 200 cases of sulfonamide resistant gonorrhea in which treatment with penicillin was used. The penicillin was dissolved in sterile distilled water, 100,000 units being dissolved in 20 cc. The patients are given five intramuscular injections of 4 cc. (20,000 units) at two or three hour intervals until a total of 100,000 units has been administered. There were 27 patients who required two or more courses of penicillin. Twenty-nine patients developed complications. There were 3 patients with gonorrheal arthritis all of whom had an immediate good response to penicillin. Four patients with prostatic abscess showed immediate response to penicillin therapy. Seventeen patients had an acute epididymitis on entry, and 5 developed epididymitis following penicillin. Penicillin had little or no effect on this condition. Sulfonamide therapy should be continued as long as possible to keep the infection localized, even though clinical improvement is not noted. Irrigations and instillations, the cause of the majority of complications, should be avoided. The observations on the 200 cases convinced the author that penicillin has proved its worth in sulfonamide resistant cases of gonorrhea. All patients were returned to duty in one third of the time previously required.

New York State Journal of Medicine, New York

44:2399-2526 (Nov. 15) 1944

War and Oxygen Therapy. J. H. Evans.—p. 2443.
Penetration of Allergens into Human Skin. F. Herrmann, M. B. Sulzberger and R. L. Baer.—p. 2452.
Fracture of Neck of Femur. S. Kleinberg.—p. 2460.
Evaluation of Use of Curare in Endoscopy. J. S. Silverberg and F. P. Ansbro.—p. 2468.
Fundamental Characteristics of Different Medicolegal Systems in the United States. B. M. Vance.—p. 2472.
Intradermal Reaction as Aid in Diagnosis of Granuloma Inguinale. B. A. Kornblith.—p. 2476.
Diabetes Mellitus and Arteriosclerosis: Effect of Duration and Severity on Arterial Changes. J. F. Hart and J. R. Lisa.—p. 2479.
Modern Treatment of Varicose Veins. W. M. Cooper.—p. 2483.
Spinal Fluid Findings in Cases of Syphilis in General Population of Males Between Ages of 18 and 38 Years, Without Detectable Neurologic Changes. F. P. Guidotti, R. N. Carrier and W. E. Stumpf. p. 2488.

Public Health Reports, Washington, D. C.

59:1423-1454 (Nov. 3) 1944

Infectivity of Mycobacteria for Chorioallantoic Membranes of Chick Embryos. G. L. Fite and B. J. Olson.—p. 1423.

59:1455-1482 (Nov. 10) 1944

Prophylactic Effect of Sulfadiazine and Sulfaguanidine Against Mosquito Borne Plasmodium Gallinaceum Infection in Domestic Fowl (Preliminary Report). G. R. Coatney and W. C. Cooper.—p. 1455.
Relation of Particle Size to Effectiveness of Paris Green Used in Airplane Dusting for Mosquito Control. R. L. Metcalf and A. D. Hess.—p. 1458.

59:1483-1514 (Nov. 17) 1944

Age and Sex Incidence of Influenza in Epidemic of 1943-44, with Comparative Data for Preceding Outbreaks. S. D. Collins.—p. 1483.

59:1515-1542 (Nov. 24) 1944

Laboratory Method of Determining Potency of Typhoid Vaccine. J. J. Griffitts.—p. 1515.
Isolation of a Filter Passing Agent from the Rabbit tick Haemaphysalis Leporis-Palustris Packard. E. A. Steinhaus and R. R. Parker. —p. 1528.

Rhode Island Medical Journal, Providence

27:501-568 (Oct.) 1944

Diagnosis of Peptic Ulcer. E. S. Emery Jr.—p. 509.
Medical Education—Old Purposes and New Methods. H. R. Viets. —p. 512.

27:569-632 (Nov.) 1944

Carcinoma of Endometrium. G. W. Waterman.—p. 577.
Hemolytic Disease of the Newborn (Erythroblastosis Fetalis) in One of Twins. M. Adelm.—p. 580.
Case Against the Impacted Tooth. H. A. McGuirl.—p. 580.
Cash Sickness Fund Illness Claims. H. J. Hall.—p. 594.

Southern Medical Journal, Birmingham, Ala.

37:597-678 (Nov.) 1944

*Nutrition Survey in Rural North Carolina. D. F. Milam and R. K. Anderson.—p. 597.
*Enigma of Pellagra. R. E. Remington.—p. 605.
Lantzounis Periosteocapsuloplasty for Congenital Dorsal Subluxation or Congenital Overlap of Fifth Toe. B. B. King.—p. 614.
Abdominal Trauma with Rupture of Spleen and Kidney: Case. D. C. Peters.—p. 617.
County Medical Examiner System: Need for a New Order. R. R. Killinger and L. Y. Dyrenforth.—p. 618.
Determination of Renal Function in Congestive Heart Failure. J. A. Boone.—p. 622.
Onset of Diabetes During Infection: Case. H. J. John.—p. 625.
Acute Pharyngitis Due to Decompensation of Circulatory System. G. R. Laub.—p. 627.
Incidence and Epidemiologic Significance of Hemolytic Streptococci in a Florida Army Camp. A. M. Glazer and J. S. Gots.—p. 628.
Intravenous Anesthesia in Children. J. D. Holly.—p. 631.
Neurocytoma of the Adrenal and Neuroepithelioma of Retina: Case Reports. I. M. Wise.—p. 637.
Preliminary Note on Method for Rapid Examination of Endometrium. C. D. Bahl and G. S. McClelland.—p. 640.

Nutrition Survey in Rural North Carolina.—Milam and Anderson carried out a nutrition survey in Wayne County, in eastern North Carolina, where hookworm and malarial infections are only moderately prevalent. The first survey, an intensive one, was limited to one rural township of 5,000 population, of which 10 per cent, predominantly school children, were examined. The second, or "extensive, survey" comprised 900 individuals and was made up of 200 families. These families (120 white, 80 Negro) were distributed among the owner, tenant and sharecropper population in proportion to the size of their groups. Vitamin C dietary intake data show for white and Negro groups that 40 per cent and 50 per cent respectively consumed less than one fourth of the recommended allowance. However, studies on the plasma revealed that the zero plasma levels are not so frequent as the low dietary intakes would presuppose. No scurvy was diagnosed. Vitamin A figures were much more favorable. Only 5 and 8 per cent respectively of white and Negro groups ingested under 25 per cent of the recommended allowances. More than 40 per cent of all groups except white children ingested the full recommended amount of 5,000 international units daily. Over 50 per cent of all groups consumed less than half of the recommended allowances of both thiamine and riboflavin. Calcium and iron intakes were considerably less favorable in Negro than in white groups. Forty-three per cent of white persons and 25 per cent of Negroes ingested three fourths of the recommended level of calcium. The protein intake data show that 60 per cent of white adults and 50 per cent of Negro adults ingested three fourths or more of the recommended level of 70 Gm. daily while 8.3 per cent of white adults and 12.6 per cent of Negro adults ingested less than half. The mean intake of calories remained constantly under 2,000. Home made biscuits characteristically baked from white flour with baking powder or soda added were the chief source of calories, constituting approximately 20 per cent of the calories for all groups. Fat pork was the second caloric source for adults and corn bread the third. The foods in order of their contribution to calories were, for white children, biscuit, milk, white bread, fat pork, cocoa and ice cream, and corn bread; for colored children, biscuit, corn bread, fat pork, fish, lean pork and milk. The authors evaluate vascularization of the cornea, gingivitis, hyperkeratotic skin and height-weight records. They conclude that, in view of the fact that the dietary intake levels were far below the standards recommended by the National Research Council, better planned dietaries with greater intake of protective foods seem to be the need. A nutritional educational campaign or improvement in economic, social and cultural conditions may be the essential basic procedure.

The Enigma of Pellagra.—According to Remington public health statistics show a decline in pellagra mortality rates in thirteen Southern states between 1928 and 1940 of 77 per cent, this being a much higher rate of change than for any other endemic disease. In South Carolina, where the death rate was highest, this decline has continued through 1943, amounting to 91 per cent of the rate in 1928. In this state there has also been a parallel drop in incidence of the disease, indicating that the improvement is due to some combination of causes which affects the entire population and not to remedial measures. The annual distribution of bulk dried brewers' yeast parallels incidence, indicating that it was used for treatment rather than for prevention. Distribution of money or food by federal relief agencies during the years 1935-1938 had no favorable effect on pellagra, there having been a slight increase in both incidence and mortality during those years. Mortality among Negroes is higher than among white persons but has decreased more rapidly. The means by which this population fraction of lowest economic status has been able to make superior progress in eradicating pellagra is not clear. The fact remains that the Negroes of the South, with less to do with and with less attention from welfare workers, have been able to make substantially greater progress in reduction of pellagra than has the white population. The fact that they were able in depression years to show a decrease of 77 per cent as compared with 40 per cent for white persons (in South Carolina) is evidence that since 1928 the pellagra death rate has been influenced by other factors sufficiently potent to overcome in part the economic one. The female death rate from pellagra is about 2.5 times the male in Negroes and 1.75 in white persons. This sex difference is limited to the years of active sex life and suggests further investigation into the etiology of pellagra. Since pellagra incidence and mortality rates have fallen, it can be inferred that general malnutrition may have decreased to a somewhat similar degree. It is predicted that these rates will continue to decline and that the rate of decline may be accelerated by such efforts as the national nutrition program and the enrichment of refined cereal products with vitamins.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

67:69-140 (June) 1944

Neurologic Complications of Dissecting Aortic Aneurysm. A. D. Weisman and R. D. Adams.—p. 69.
Distinctive Type of Encephalomyelitis Occurring Among Troops in Northern Territory of Australia: Discussion of 2 Fatal Cases. J. P. Horan, G. A. W. Johnston, J. H. Halliday, J. O'Brien and E. W. Hurst.—p. 93.
Review of Some Recent Observations on Demyelination. E. W. Hurst. —p. 103.
Fiber Interaction in Injured or Compressed Region of Nerve. R. Granit, L. Leksell and C. R. Skoglund.—p. 125.

British Medical Journal, London

2:489-520 (Oct. 14) 1944

Control of Bacillary Dysentery. R. W. Fairbrother.—p. 489.
*Plasma Acid Phosphatase in Carcinoma of Prostate and Effect of Treatment with Stilbestrol. J. M. Watkinson, G. E. Delory, E. J. King and A. Haddow.—p. 492.
Medical Experiences in North Africa, 1943-1944. T. C. Hunt.—p. 495
Analgesia in Labor: Record of 102 Cases Treated with Pethidine. J. A. R. Cripps, Barbara Hall and W. F. T. Haultain.—p. 498.
Spontaneous Lobectomy. J. W. Taylor.—p. 500.

Plasma Acid Phosphatase in Carcinoma of Prostate.—Watkinson and his collaborators describe a method for estimating acid phosphatase and values obtained for plasma acid and alkaline phosphatase in various clinical conditions and in normal controls, and for acid phosphatase in seminal fluid. Two specimens of seminal fluid from a case of eunuchoidism contained relatively negligible amounts of acid phosphatase. Of 10 cases of prostatic carcinoma, 6 showed a raised acid phosphatase content in the plasma; in 5 of these there was x-ray evidence of metastases in bone. Several of the results do not show great distinction between prostatic carcinoma with metastases and Paget's disease. The behavior of the plasma phosphatases in cases of carcinoma of the prostate in which the plasma acid phosphatase was originally raised was followed during treatment with diethylstilbestrol. The response shows a uniformity of pattern, the acid phosphatase falling abruptly to a normal level, which is then maintained for considerable periods, with a rise in alkaline phosphatase followed by a gradual fall. In 10 cases of carcinoma of the prostate 4 showed some degree of regression of the primary tumor under treatment with diethylstilbestrol, and secondary deposits in lymph nodes underwent regression in 3 cases. X-ray examination at three monthly intervals in cases with metastasis to bone revealed in some a progressive increase in density, while in others the deposits became more numerous during treatment or increased in size. With one exception all cases showed some symptomatic and general improvement in relief from pain, lessening of frequency of micturition, gradual increase in hemoglobin level, improvement in appetite and gain in weight.

Lancet, London

2:521-552 (Oct. 21) 1944

Conservative Treatment of Abdominal Wounds. C. G. Rob.—p. 521.
New Drugs Active in Chemotherapy of Experimental Gas Gangrene. D. G. Evans, A. T. Fuller and J. Walker.—p. 523.
Desert Climate: Physiologic and Clinical Observations. W. S. S. Ladell, J. C. Walterlow and M. F. Hudson.—p. 527.
Congenital Absence of Sweat Glands. D. H. G. MacQuaide.—p. 531.
*Tragedy of Malignant Melanoma. Margaret C. Tod.—p. 532.
Venous Spasm Preventing Blood Transfusion. J. G. Humble and G. Belyavin.—p. 534.
Sulfanilamide Poisoning with Cerebral Manifestations. H. Reed.—p. 535.

Tragedy of Malignant Melanoma.—Tod thinks that there is no greater tragedy in medicine than the death from multiple metastases of a young patient who had been in perfect health until a small pigmented mole was removed for cosmetic reasons. Unfortunately ignorance regarding the great danger of interfering with any pigmented mole or "birthmark" still prevails. Casual excision, ligation or cauterization of pigmented moles has led to the rapid death of 34 patients referred to the Holt Radium Institute when the appearance of recurrence or metastasis gave the alarm. These 34 patients were among 100 seen at the institute. It is never justifiable to remove, for cosmetic reasons, a pigmented lesion which shows no sign of active growth. A patient who wishes to have such a lesion removed must be strongly advised to leave it alone and warned that any form of minor treatment is dangerous. If he insists on removal, the operation must be in every way as radical as if the lesion showed signs of active growth. A patient may come for advice because a pigmented lesion has begun to grow (*a*) spontaneously, (*b*) after injury or (*c*) after injudicious treatment. If there is no doubt that a lesion likely to be a melanoma is growing, treatment must be radical. A patient may come with a pigmented lesion, which may or may not show signs of growth, and enlarged regional lymph nodes. If the regional lymph nodes are involved the treatment is surgical. Lymph nodes should not be treated by irradiation except for palliation when they are completely inoperable. A patient, when first seen, may have multiple metastases. When metastases are already present beyond the regional lymph nodes, cure is practically impossible. Palliative irradiation may be tried and sometimes prolongs life and prevents suffering by delaying the local breakdown of lesions on the surface until metastases in lung or liver end life in a more merciful way. The author lists results obtained among the aforementioned 100 patients: 50 are dead, and of the 50 who are alive 40 are well, whereas 10 have recurrences.

Khirurgiya, Moscow

2:3-54, 1944. **Partial Index**

Plaster of Paris Cast for Prevention of Deformities of Lower Extremities After Gunshot Wounds. G. S. Bom.—p. 3.
Contribution to Compatibility in Blood Transfusion. D. N. Belenkiy. —p. 10.
*Refrigeration Anesthesia for Amputations of Extremities. S. V. Lobachev.—p. 16.
Skin Plastic in Restorative Surgery in Base Hospitals. F. L. Gektin. —p. 26.
Indications for Late Amputations After Gunshot Injuries of Extremities. Ya. L. Levi.—p. 35.
Anaerobic and Aerobic Flora of Foreign Bodies, of Bone Sequestrums and of Wound Secretions. L. A. Chernaya and E. O. Aberman. —p. 40.
Tetanus in Base Hospitals. E. L. Fayvishenskiy.—p. 44.
Treatment of Penetrating Wounds of the Neck. G. T. Drobyshev. p. 49.

Refrigeration Anesthesia for Amputations of Extremities.—Animal experiments carried out at the Sklifassovskiy Institute (Moscow) demonstrated that lowering the temperature of tissues between 5 and 10 degrees centigrade obtains satisfactory anesthesia for operative intervention. Refrigeration below this point leads to irreversible alterations in the tissues, while temperatures above 10 degrees do not procure adequate anesthesia of the tissues. Circulating blood in the vessels becomes concentrated under the influence of refrigeration, but its morphologic elements remain unaltered. Lowering of the temperature of the tissues causes lowering of biologic qualities of living protoplasm and interrupts nervous impulses, conductivity and sensitivity of nerve endings. Gradual cooling induces anesthesia without painful sensations. The pain sense is the first to disappear, followed by loss of the thermal sense and finally by loss of the tactile sense. Microscopic studies of the tissues refrigerated to 5 C. revealed no structural changes from normal tissues. Apparently the changes in an anesthetized extremity are of molecular alteration of colloid substances and cannot be recognized by microscopy. The advantages of this method of anesthesia, as observed in amputations of lower extremities in 100 cases of street trauma, demonstrated the safety of the method, complete anesthesia, elimination of narcotics, absence of operative shock and postoperative complications, and arrest of infection, including that of gas gangrene. The stumps healed readily. There were only 4 instances of postoperative suppuration of the wound. The growth of the micro-organisms is arrested during the process of refrigeration. After the period of refrigeration the micro-organisms again display capacity for growth and multiplication. However, their number is considerably diminished. The effect of refrigeration on shock is explained particularly by the alleviation of pain, while application of a tourniquet and refrigeration interferes with formation of toxins and their absorption. Refrigeration anesthesia is particularly indicated for sick, emaciated and septic patients.

Book Notices

Radiation and Climatic Therapy of Chronic Pulmonary Diseases with Special Reference to Natural and Artificial Heliotherapy, X-Ray Therapy, and Climatic Therapy of Chronic Pulmonary Diseases and All Forms of Tuberculosis. Edited by Edgar Mayer, M.D., F.A.C.P., F.A.C.C.P., Assistant Professor of Clinical Medicine, Cornell University Medical College, New York. Cloth. Price, $5. Pp. 393, with illustrations. Baltimore: Williams & Wilkins Company, 1944.

This volume is intended for both the chest specialist and the general practitioner. It deals with light, x-ray and climatologic therapy as applied to chronic pulmonary diseases, including all forms of tuberculosis. The twenty-six chapters are prepared by twenty-three different authors. The section on light therapy consists of chapters on the physics of light radiation, physiologic action of light and sources of light. The section on artificial light therapy includes discussions of the effects of light from artificial sources on tuberculosis of the lungs, pleura, pharynx, trachea, bronchi, intestine, peritoneum, lymph nodes, urogenital organs, skin, middle ear and eye. The section on solar radiation and climatotherapy includes chapters on climate and weather effects on respiratory infections, solar radiation and climatotherapy in a cool, low altitude in the high, sunny Colorado Rockies, in the sunny Southwestern Desert, in a cold, moderate altitude, and solar radiation of tuberculosis in high, sunny altitudes. The section on x-ray therapy includes discussions of chronic nontuberculous mediastinal and pulmonary disease, intrathoracic tumors and tuberculosis of the cervical lymph nodes, of the intestine and peritoneum, skin, pelvic organs, bones and joints. Two chapters are devoted to the surgical versus conservative therapy in the treatment of tuberculosis of the bones and joints. An excellent summary is presented by Dr. Mayer on climatic, x-ray and light therapy of chronic pulmonary diseases and all forms of tuberculosis. This is a timely book and one much needed, since there has been considerable confusion in the minds of physicians regarding the efficacy, particularly of light and climate, in the treatment of various diseases. The editor's long experience in this field qualified him to select those persons best prepared to present the various subjects. Therefore in this book is to be found the latest and most authentic information on the subjects presented. It can be highly recommended to physicians everywhere.

Neurology of the Eye, Ear, Nose, and Throat. By E. A. Spiegel, M.D., Professor of Experimental and Applied Neurology and Head of Department of Experimental Neurology, Temple University School of Medicine, Philadelphia, and I. Sommer, M.D., Consultant Ophthalmologist and Otolaryngologist, Chicago Eye and Ear Hospital. Cloth. Price, $7.50. Pp. 667, with 118 illustrations. New York: Grune & Stratton, 1944.

This is a tremendous piece of work. It seems to the reviewer that a separate book on the neurology of the eye and another on the neurology of the ear, nose and throat should have been written. By doing this more emphasis could have been placed on clinical cases and detail. There are four parts: neurology of the ear, neurology of the eyes, neurology of the nose, mouth, pharynx and larynx, and local symptoms of the brain stem and the cerebrum. This book is an English edition of the authors' oto-ophthalmo-neurologie except that it has been almost completely rewritten. Anatomy, physiology and pathologic disturbances of the nervous mechanisms related to the eye, ear, nose and throat are outlined. There are 1,719 references in the bibliography. The book is recommended to eye, ear, nose and throat residents as well as to neurologists interested in the eye, ear, nose and throat.

Poisonous Plants of Hawaii. By Harry L. Arnold, M.D. Boards. Price, $2. Pp. 71, with 24 illustrations. Honolulu: Tongg Publishing Company, 1944.

This little book contains concise discussions of the common and dangerous plants of Hawaii, some notes on allergic reactions and Hawaiian mushroom-like fungi, a comprehensive list of all plants which have been listed as being poisonous and a bibliography. The volume has numerous illustrations and gives much useful information about poisonous plants and their remedial measures when needed. The volume should find wide use by the general practitioner in Hawaii.

Diseases of the Nose, Throat and Ear: A Handbook for Students and Practitioners. By I. Simson Hall, M.B., Ch.B., F.R.C.P.E., Surgeon to the Royal Infirmary, Edinburgh. Third edition. Cloth. Price, $4.50. Pp. 459, with 90 illustrations. Baltimore: William Wood & Company, 1944.

The first edition of this manual was published in 1937. Other editions are that of 1941 and the present one. Like many of its kind, this work is based on lectures to students and general practitioners. Preceding each section there is a brief sketch of the anatomy concerned, but no bibliography is offered, although "the student is expected to refer to larger works." The commoner diseases, deformities and injuries of the nose are satisfactorily described, such as deviated septum, polypi, the various types of "rhinitis" including atrophic and syphilitic, hemorrhage, diphtheria and sinusitis. On page 163 under the heading "Removal of Adenoids Alone" the author describes the procedure of adenoidectomy under ethyl chloride and states that "in certain cases . . . it is desirable to remove the adenoids and to leave the tonsils . . . the converse is never the case." He takes the view that if there has been no history or clinical sign of "tonsil trouble" the tonsils may be left. This is contrary to American thought and practice. Tonsillectomy here is recommended as a preventive of subsequent throat infections, for it is thought to be ultraconservative to attempt to "save the tonsils" since later removal is likely to become obligatory. However, some authorities still cling to the British point of view. The final section of the book deals with the ear and is quite complete as to the types of otitis media seen in general practice and the complications arising therefrom. It is questionable, nevertheless, whether a detailed description of radical mastoidectomy and labyrinthectomy need be included in a handbook of this sort. The author's view on the use of the sulfonamides is safe and sane. He agrees that they are to be administered in the hospital only and under laboratory control.

Lumbo-Sacral Strain: A Handbook on Its Relief and Cure by Manipulative Therapy. By H. Vincent Langley. With foreword by N. Howarth Hignett. Cloth. Price, 6s. Pp. 24, with 12 illustrations. London: Research Books, Ltd.; distributed by Wm. Heinemann, Ltd., 1944.

This small volume begins with a foreword from a layman that is nothing more than a testimonial. In the introduction one finds that the same layman has corrected proofs of the book. In the introduction "the writer has attempted to demonstrate that lumbosacral and rotating lumbosacral strains are produced through faulty mechanism of the pelvis." This is not new to the orthopedic profession in any country. Although the author states that the physical signs are pathognomonic, a good observer would disagree because there are many other conditions of the low back which show the same signs, and here lies the danger of putting the book into the hands of practitioners who, for the most part, are not interested in orthopedic problems. The writer does not go far enough when he ascribes the causes of increased inclination of the pelvis to muscular relaxation. It has been demonstrated that a contracted fascia lata is also a cause. The symptoms described are sketchy and the area of tenderness is not often along the superior gluteal nerve but is due to spasm of the upper part of the gluteal muscle. His reference to high heels is not borne out by the facts; more men than women are now affected by lumbosacral strain. As a matter of fact, raising a heel may relieve a lame back within a few days. It is difficult to believe that the springing and the manipulations described will relieve back pain; e. g. side stretching of the spine is done while pressure is exerted on the second and the third lumbar and not below for fear that lumbosacral strain will be increased. Any one with a modicum of knowledge of the physiology of the spine knows that spinal movements are combined and that side counterpressure on the third lumbar will be transmitted to the lumbosacral junction. The exercises outlined on page 16 are known to most orthopedic surgeons and are simple, but the author is not definite about when they should be given or in what order, and there are no warnings about doing them too much or too long. One is left with the impression that this incomplete book should not be put in the hands of the general practitioner until he knows more about the general principles of physical medicine.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TECHNICS OF MASS IMMUNIZATION

To the Editor:—What technics in the sterilization of syringes and needles, the frequency of changing them and the use of topical antiseptics should be followed in mass inoculation of soldiers?

Rodney C. Larcom Jr., Captain, M. C., A. U. S.

ANSWER.—In consideration of the military necessity of carrying out required immunizations on large numbers of troops with as little interference with training and other duties as possible, it is necessary to adopt the simplest and most rapid procedure consistent with safety. The most careful aseptic technic must be exercised at all times.

The largest syringes are employed which will permit accurate measurement and delivery of the proper dose: 5 or 10 cc. syringes are usually satisfactory. These are initially sterilized by heat, filled with the vaccine or other immunizing agent and used until empty. The syringe may be refilled without resterilization if care is taken. The needle must be changed after each injection, a supply of freshly heat sterilized needles being kept on hand. If accidental contamination of the interior or tip of the syringe occurs or if blood enters the syringe, it should, of course, be discarded. Tincture of iodine, 70 per cent ethyl alcohol or an approved mercurial antiseptic should be used for skin sterilization, preceded by cleansing with soap and water if indicated. For smallpox vaccination, however, the arm should be prepared by washing with soap and water, ether or acetone and allowed to dry thoroughly before the vaccine is deposited on the skin; nonvolatile antiseptics, including alcohol, should be avoided, as they may inactivate the vaccine.

HEREDITY OF ALOPECIA AREATA

To the Editor:—Is alopecia hereditary? A woman 25 years old is bald except for a few patches of hair about an inch long. This alopecia began at the age of 7. What would be the probable result if she married and had children? There has been no family history of a similar condition.

M.D., Indiana.

ANSWER.—This patient has alopecia areata, the real cause of which is unknown. It is classed as a trophoneurosis due to some abnormality of the sympathetic nerves supplying the skin or its vessels; instances are commonly seen where there has been a preceding shock to the nervous system. It is most common in childhood and early adult life. "Sabouraud supplies the most convincing evidence that heredity plays a part, for he found that 22 per cent of 81 cases gave a history that other members of the family had the same disease. In Sabouraud's family groups six show a father and son affected, a seventh two brothers and the son of one of them. In one family a boy, his mother and the mother's brother and his maternal grandfather were all affected. In four families a generation is skipped: in one a boy and his father's brother had it, but his father escaped: in another a boy and his mother's brother had it but his mother escaped" (Cockayne, E. A.: Inherited Abnormalities of the Skin, London, 1933, Oxford University Press). A case in which there was evidence of the disease being inherited has never been seen by the writer. In view of the patient's family history, the chances of her offspring developing the disease seem small.

BLOOD LOST FROM TONSILLECTOMY

To the Editor:—I should like to know how much blood is lost during an average tonsillectomy under local and general anesthesia, and how this blood loss compares with some of the more common surgical procedures.

M.D., Illinois.

ANSWER.—A reasonably careful search of the literature has not revealed information dealing with quantitative losses of blood during tonsillectomy done under either local or general anesthesia. The blood loss must obviously vary depending on the method of operation, the surgeon and the individual case.

In general the blood loss is higher under general anesthesia than when a local anesthetic is used. This is due in the first place to the cerebral congestion caused by ether, which is the anesthetic most commonly used, and to the fact that some vasoconstrictor, such as epinephrine, is commonly used in conjunction with the local anesthetic agent injected.

Those who do tonsillectomies know that occasionally the blood loss may be no more than a few drops. In other instances it may be 30 to 100 cc. or more, but the latter amount is probably not common.

During a herniotomy or appendectomy the blood loss may be 100 to 200 cc.; in hysterectomy the loss is much greater. These figures are casual estimates. A careful study would require weighing the actual amount lost. The only discussion of this in a related field is the careful work done by Lyman Richards on blood loss during adenoidectomy (Some Considerations of Adenoid Bleeding, *Ann. Otol., Rhin. & Laryng.* **44**:117 [March] 1935.

SPLENOMEGALY AND ASCITES

To the Editor:—For about two years a woman aged 35 has complained of intermittent nausea, vomiting, weakness, sweating, abdominal pain and bloating. She has become anemic, but there is no history of jaundice, hemorrhages or ecchymosis. There is no history of malaria, and the family history is negative for any previous similar trouble. There has been a loss of 55 pounds (25 Kg.) in five months. On physical examination the findings, except for slight pallor, are a large firm mass in the left upper quadrant, moderate enlargement of the liver and a small amount of fluid, essentially negative. Blood pressure is 110/80, hemoglobin 72 per cent, red blood cells 3,950,000, white blood cells 5,800, polymorphonuclears 64 per cent, small lymphocytes 30 per cent, large monocytes 6 per cent, urinalysis negative. Fragility test of the red blood cells showed an initial hemolysis at 0.38 per cent and complete at 0.30 per cent, bleeding time three and one-half minutes, coagulation time four and one-half minutes. A chest x-ray was negative. A preoperative diagnosis of Banti's syndrome was made. The abdomen was opened through an upper left rectus incision and a general exploration done. The liver was large and mottled in appearance and seemed to contain a lot of colloid-like material. It looked something like tapioca or the cross section of a colloid goiter. There was a little serous fluid present and a huge spleen with little evidence of perisplenitis. It was removed without difficulty. At the hilus of the spleen were a number of smooth nodules which appeared to be large, dark lymph nodes or multiple accessory spleens. There was congestive splenomegaly with foci of fibrosis and angiomatous areas with some hemorrhage. The lymph nodes showed chronic hyperplastic lymphadenitis. The diagnosis was advanced congested splenomegaly and chronic hyperplastic lymphadenitis. The convalescence was characterized by a rapid pulse, considerable fever, diffuse bronchitis and the development of ascites. The patient is in fairly good condition at present. The kidneys and bowels are normal, the appetite is good. The ingestion of fluids is limited and there is no medication other than capsules of bile salts. After return from the hospital, tappings were instituted at weekly intervals and light fluid in 10 pound amounts recovered, but at this time tappings at four day intervals produce 15 pounds of milky fluid. Could you suggest any treatment to lessen the accumulation of fluid?

M.D., Utah.

ANSWER.—Ascites of this type is assumed to be due to obstruction in the portal circulation. In Banti's syndrome this obstruction is sometimes relieved by splenectomy. The failure of the result here does not make the problem simpler. Ascites is often relieved (but not cured) by the administration of one of the mercurial diuretics. When the diuretic is preceded by a few days of administration of one of the acid-base salts, such as ammonium chloride, the fluid output may be enhanced still further. This may result in fewer tappings.

Surgical establishment of a circulation to bypass the liver may be considered. Theoretically this may be done by abrading the liver capsule or by suturing the omentum to the structures of the abdominal wall. Satisfactory results are problematic. For the liver cirrhosis itself high carbohydrate and high vitamin diets are advocated. If this is a true "Banti's syndrome," any treatment is only palliative.

BLOOD CLOTTING

To the Editor:—What is the significance of a blood plasma which coagulates even before the red cells? The plasma thickens and has the appearance of lipemia, although I do not think this is actually present. The patient has had Hodgkin's disease for eleven years.

M.D., Ohio.

ANSWER.—Since plasma coagulates and red cells do not, the inquirer probably wishes to know the significance of a pale clot as compared with the normal red clot in blood which has coagulated in a test tube. This phenomenon occurs whenever there is a rapid sedimentation of the erythrocytes, so that the red cells have time to separate out before coagulation starts. The clot is normally red merely because erythrocytes are trapped in the fibrin network which forms in the clotting process. If the red cells have sedimented before clotting begins, the supernatant plasma coagulates, giving rise to the so-called buffy coat. This phenomenon occurs in conditions associated with a rapid sedimentation rate; it is usually due to a high fibrinogen content of the blood plasma, although disturbances in the albumin-globulin ratio, or the appearance of abnormal globulins in the plasma, can also produce this effect occasionally.